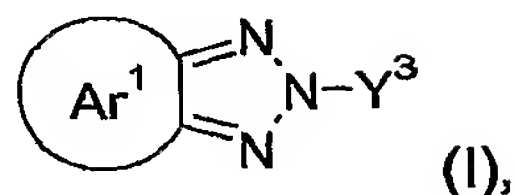
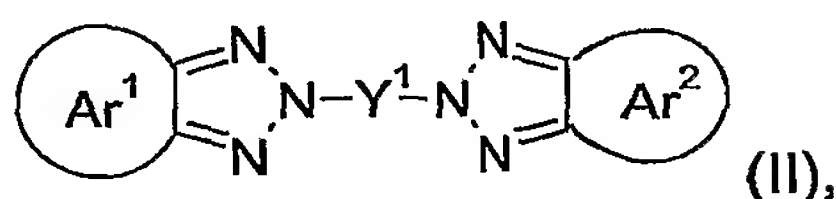


Claims

1. A 2H-benzotriazole compound of the formula



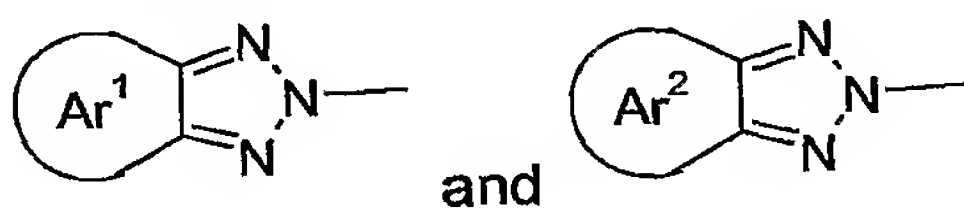
(1)



(11)

Y¹ is a divalent linking group, and

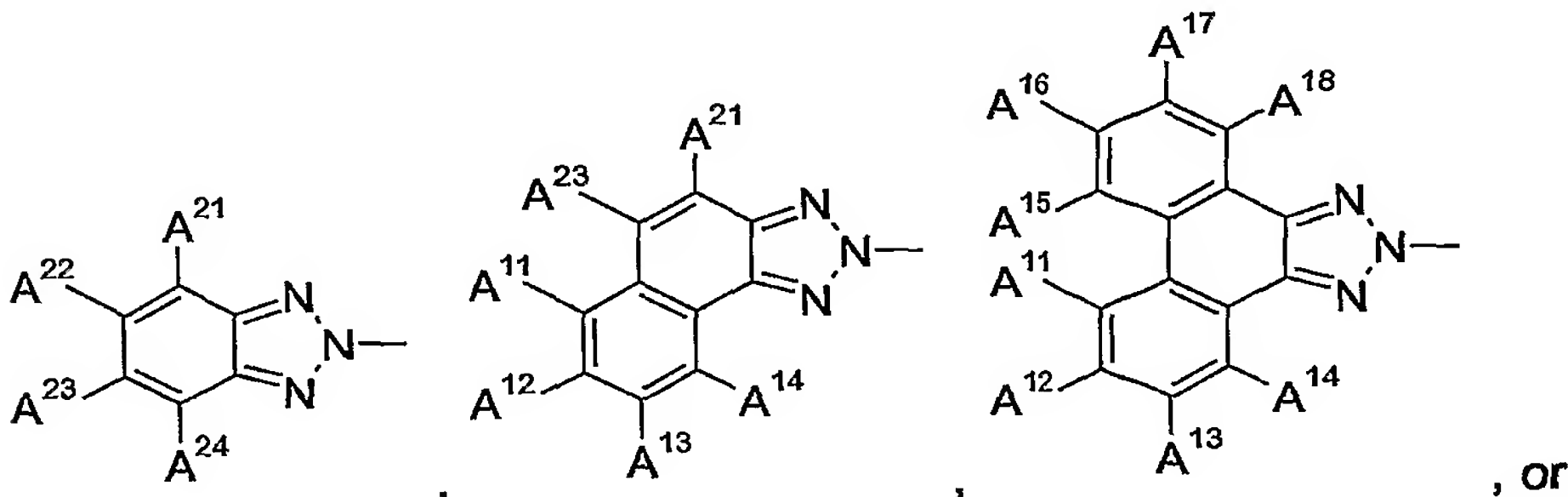
Y³ is C₁-C₂₅alkyl, especially C₁-C₄alkyl, aryl or heteroaryl, which can optionally be substituted, especially C₆-C₃₀aryl, or C₂-C₂₆heteroaryl, which can optionally be substituted.



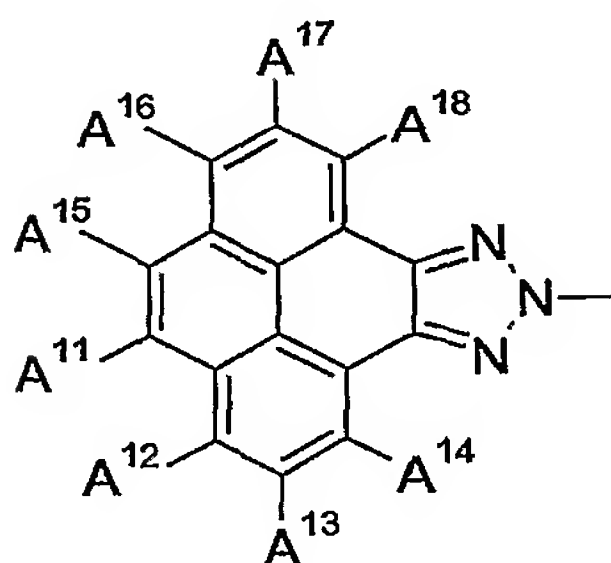
and

are independently of each other a group of

formula



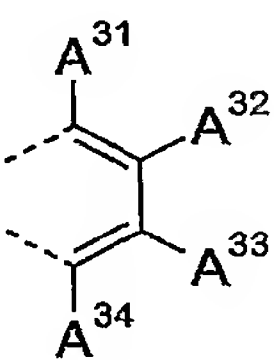
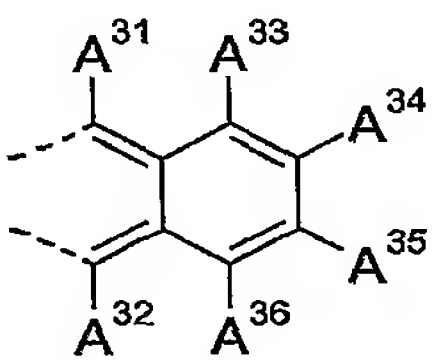
, or

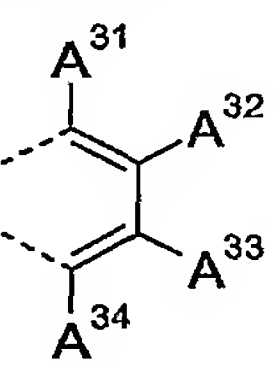
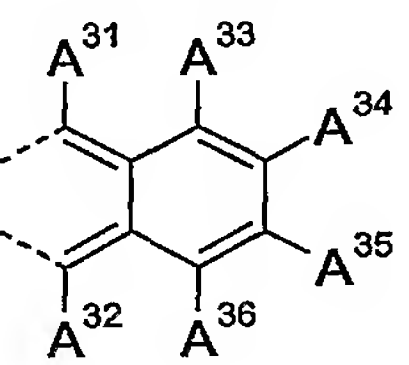


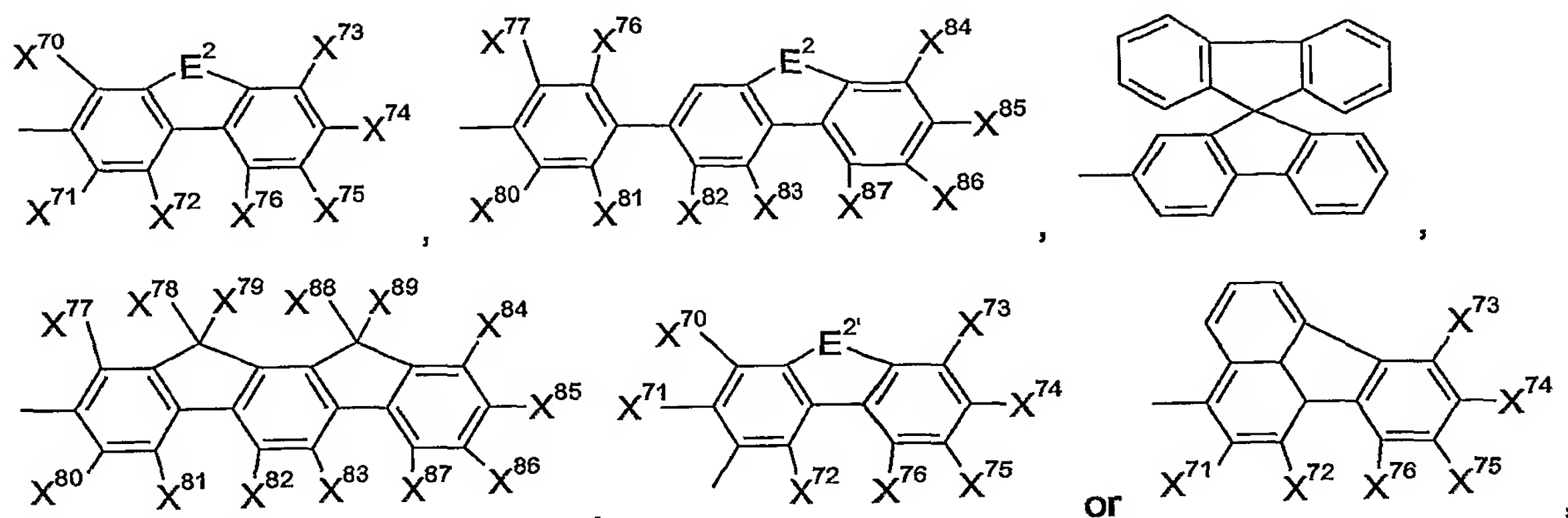
, wherein

A^{21} , A^{22} , A^{23} , A^{24} , A^{11} , A^{12} , A^{13} , A^{14} , A^{15} , A^{16} , A^{17} and A^{18} are independently of each other H, halogen, especially fluorine, hydroxy, C_1 - C_{24} alkyl, C_1 - C_{24} alkyl which is substituted by E and/or interrupted by D, C_1 - C_{24} perfluoroalkyl, C_6 - C_{14} perfluoroaryl, especially pentafluorophenyl, C_5 - C_{12} cycloalkyl, C_5 - C_{12} cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or -NR²⁵-, -NR²⁵R²⁶, C_1 - C_{24} alkylthio, -PR³²R³², C_5 - C_{12} cycloalkoxy, C_5 - C_{12} cycloalkoxy which is substituted by G, C_6 - C_{24} aryl, C_6 - C_{24} aryl which is substituted by G, C_1 - C_{24} alkyl, C_5 - C_{12} cycloalkyl, C_7 - C_{25} aralkyl, C_1 -

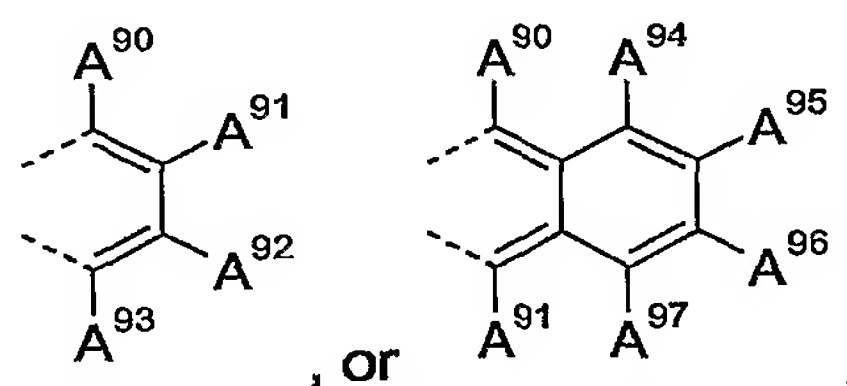
C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or C₁-C₂₄haloalkyl; C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, fluorine, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or C₁-C₂₄haloalkyl; C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, C₇-C₂₅aralkyl, which is substituted by G, C₇-C₂₅aralkoxy, C₇-C₂₅aralkoxy which is substituted by G, or -CO-R²⁸, or

A²² and A²³ or A¹¹ and A²³ are a group , or , or two groups A¹¹, A¹², A¹³, A¹⁴, A¹⁵, A¹⁶, A¹⁷ and A¹⁸, which are neighbouring to each

other, are a group , or , wherein A³¹, A³², A³³, A³⁴, A³⁵ and A³⁶ are independently of each other H, halogen, hydroxy, C₁-C₂₄alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or -NR²⁵-, C₅-C₁₂cycloalkoxy, C₅-C₁₂cycloalkoxy which is substituted by G, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, C₇-C₂₅aralkyl, which is substituted by G, C₇-C₂₅aralkoxy, C₇-C₂₅aralkoxy which is substituted by G, or -CO-R²⁸, wherein preferably at least one of the substituents A²¹, A²², A²³, A²⁴, A¹¹, A¹², A¹³, A¹⁴, A¹⁵, A¹⁶, A¹⁷ and A¹⁸ is C₆-C₂₄aryl which is substituted by fluorine, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or C₁-C₂₄haloalkyl; or C₂-C₂₆heteroaryl, especially thiophenyl, pyrrolyl, furanyl, benzoxazolyl, or benzothiazolyl, which is substituted by fluorine, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or C₁-C₂₄haloalkyl, or a group of formula



wherein X⁷⁰, X⁷¹, X⁷², X⁷³, X⁷⁴, X⁷⁵, X⁷⁶, X⁷⁷, X⁸⁰, X⁸¹, X⁸², X⁸³, X⁸⁴, X⁸⁵, X⁸⁶, and X⁸⁷ are independently of each other E and/or interrupted by D, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or -NR²⁵-, -NR²⁵R²⁶, C₁-C₂₄alkylthio, -PR³² R³², C₅-C₁₂cycloalkoxy, C₅-C₁₂cycloalkoxy which is substituted by G, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or C₁-C₂₄haloalkyl; C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, fluorine, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or C₁-C₂₄haloalkyl; C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, C₇-C₂₅aralkyl, which is substituted by G, C₇-C₂₅aralkoxy, C₇-C₂₅aralkoxy which is substituted by G, or -CO-R²⁸, or two groups X⁷⁰, X⁷¹, X⁷², X⁷³, X⁷⁴, X⁷⁵, X⁷⁶, X⁷⁷, X⁸⁰, X⁸¹, X⁸², X⁸³, X⁸⁴, X⁸⁵, X⁸⁶, and X⁸⁷,



which are neighbouring to each other, are a group wherein A⁹⁰, A⁹¹, A⁹², A⁹³, A⁹⁴, A⁹⁵, A⁹⁶ and A⁹⁷ are independently of each other H, halogen, especially fluorine, hydroxy, C₁-C₂₄alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or -NR²⁵-, C₅-C₁₂cycloalkoxy, C₅-C₁₂cycloalkoxy which is substituted by G, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, C₇-

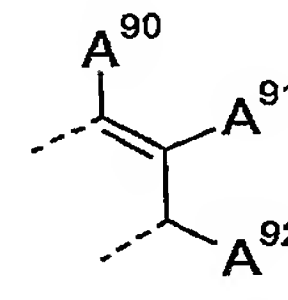
C₂₅aralkyl, which is substituted by G, C₇-C₂₅aralkoxy, C₇-C₂₅aralkoxy which is substituted by G, or -CO-R²⁸,

E² is -CR²³=CR²⁴-, especially -CX⁶⁸X⁶⁹-,

E² is -SiR³⁰R³¹-, -POR³²-, especially -S-, -O-, or -NR^{25'}-, wherein R^{25'} is C₁-C₂₄alkyl, or C₆-C₁₀aryl,

X⁶⁸, X⁶⁹, X⁷⁸, X⁷⁹, X⁸⁸ and X⁸⁹ are independently of each other C₁-C₁₈ alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, or C₇-C₂₅aralkyl, or

X⁷⁸ and X⁷⁹, and/or X⁸⁸ and X⁸⁹ form a ring, especially a five- or six-membered ring, or



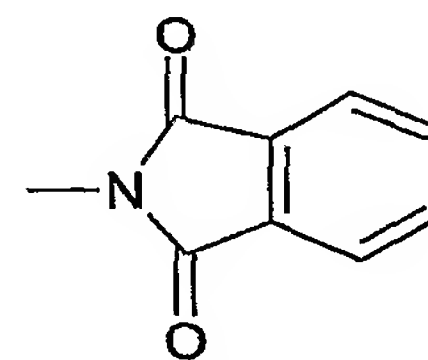
X⁶⁸ and X⁷⁰, X⁶⁹ and X⁷³, X⁷⁷ and X⁷⁸ and/or X⁸⁴ and X⁸⁹ are a group

D is -CO-; -COO-; -S-; -SO-; -SO₂-; -O-; -NR²⁵-; -SiR³⁰R³¹-, -POR³²-, -CR²³=CR²⁴-, or -C≡C-; and

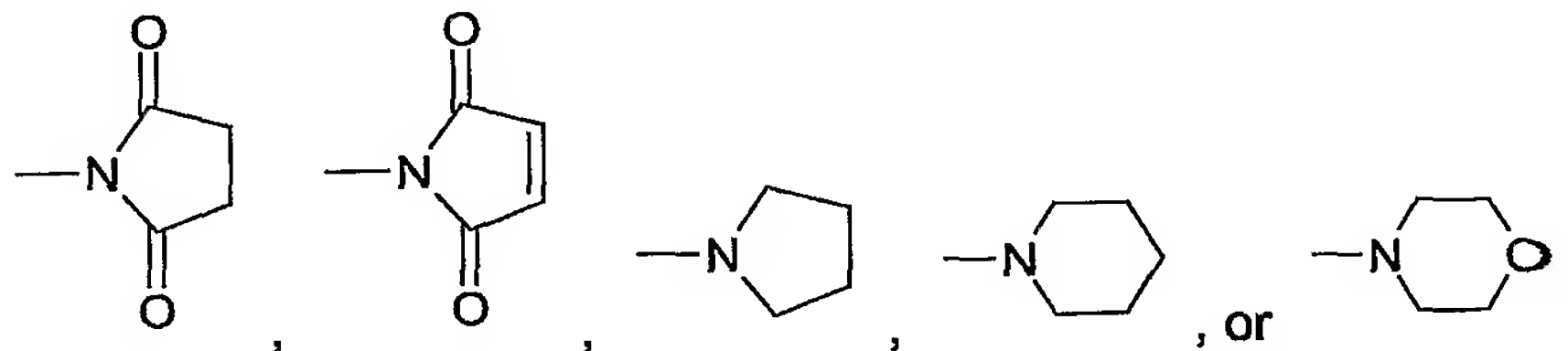
E is -OR²⁹; -SR²⁹; -NR²⁵R²⁶; -COR²⁸; -COOR²⁷; -CONR²⁵R²⁶; -CN; -OCOOR²⁷; or halogen;

G is E, or C₁-C₂₄alkyl, wherein

R²³, R²⁴, R²⁵ and R²⁶ are independently of each other H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₂₄alkyl, or C₁-C₂₄alkoxy; C₁-C₂₄alkyl; or C₁-C₂₄alkyl which is interrupted by -O-; or



R²⁵ and R²⁶ together form a five or six membered ring, in particular



R²⁷ and R²⁸ are independently of each other H; C₆-C₁₈aryl; C₆-C₁₈aryl which is substituted by C₁-C₂₄alkyl, or C₁-C₂₄alkoxy; C₁-C₂₄alkyl; or C₁-C₂₄alkyl which is interrupted by -O-,

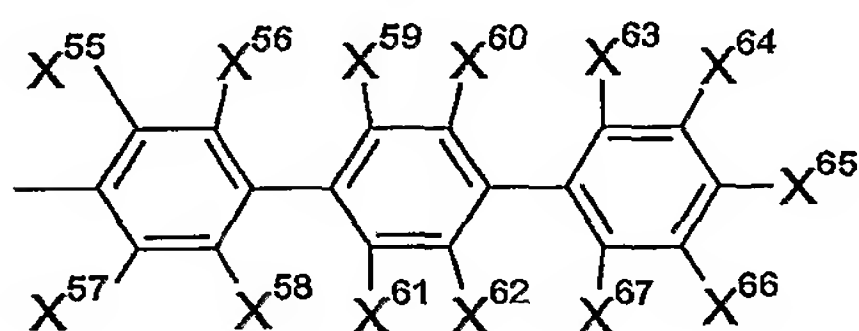
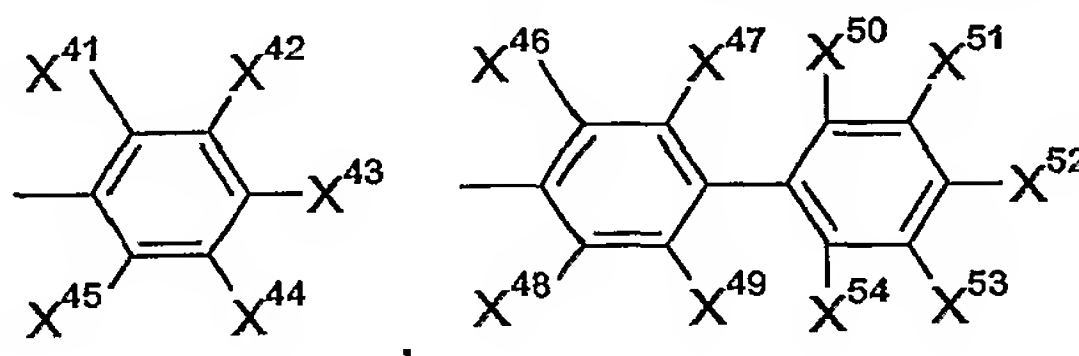
R²⁹ is H; C₆-C₁₈aryl; C₆-C₁₈aryl, which is substituted by C₁-C₂₄alkyl, or C₁-C₂₄alkoxy; C₁-C₂₄alkyl; or C₁-C₂₄alkyl which is interrupted by -O-,

R^{30} and R^{31} are independently of each other C_1 - C_{24} alkyl, C_6 - C_{18} aryl, or C_6 - C_{18} aryl, which is substituted by C_1 - C_{24} alkyl, and

R^{32} is C_1 - C_{24} alkyl, C_6 - C_{18} aryl, or C_6 - C_{18} aryl, which is substituted by C_1 - C_{24} alkyl.

- 5 2. A 2H-benzotriazole compound according to claim 1, wherein at least one of the substituents A^{21} , A^{22} , A^{23} , A^{24} , A^{11} , A^{12} , A^{13} , A^{14} , A^{15} , A^{16} , A^{17} and A^{18} , especially A^{12} , A^{21}

and/or A^{23} , are a group of formula

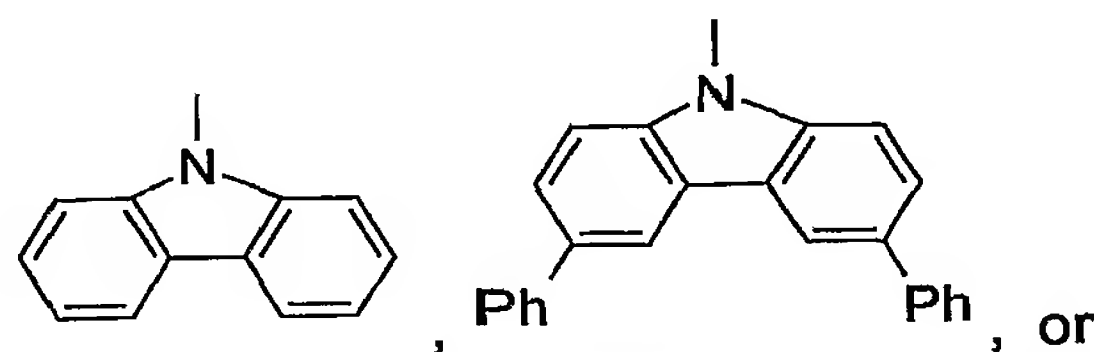


, wherein X^{41} , X^{42} , X^{43} , X^{44} , X^{45} , X^{46} , X^{47} , X^{48} , X^{49} , X^{50} , X^{51} , X^{52} , X^{53} , X^{54} , X^{55} , X^{56} , X^{57} , X^{58} , X^{59} , X^{60} , X^{61} , X^{62} , X^{63} , X^{64} , X^{65} , X^{66} and X^{67} are

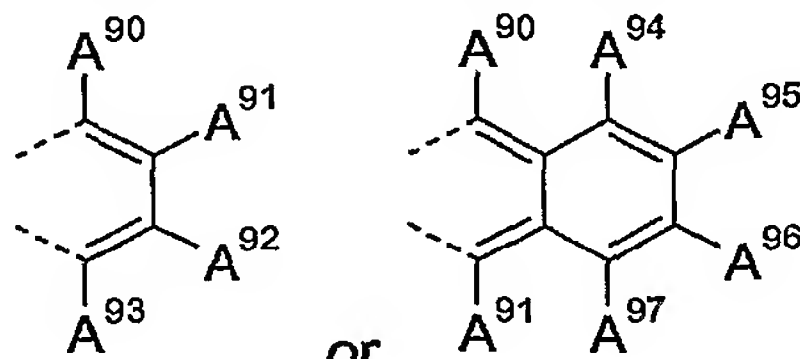
- 10 independently of each other H, fluorine, $-NR^{25}R^{26}$, C_1 - C_{24} alkyl, C_5 - C_{12} cycloalkyl, C_7 - C_{25} aralkyl, C_1 - C_{24} perfluoroalkyl, C_6 - C_{14} perfluoroaryl, especially pentafluorophenyl, or C_1 - C_{24} haloalkyl, C_1 - C_{24} alkyl, which is optionally substituted by E and/or interrupted by D, C_1 - C_{24} alkenyl, which is optionally substituted by E, C_5 - C_{12} cycloalkyl, which is optionally substituted by G, C_5 - C_{12} cycloalkoxy, which is optionally substituted by G, C_6 -
15 C_{18} aryl, which is optionally substituted by G, C_1 - C_{24} alkoxy, which is optionally substituted by E and/or interrupted by D, C_6 - C_{18} aryloxy, which is optionally substituted by G, C_7 - C_{18} arylalkoxy, which is optionally substituted by G, C_1 - C_{24} alkylthio, which is optionally substituted by E and/or interrupted by D, C_2 - C_{20} heteroaryl which is substituted by G, or C_6 - C_{18} aralkyl, which is optionally substituted by G, or

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X^{43} , X^{65} or X^{52} are a group of formula



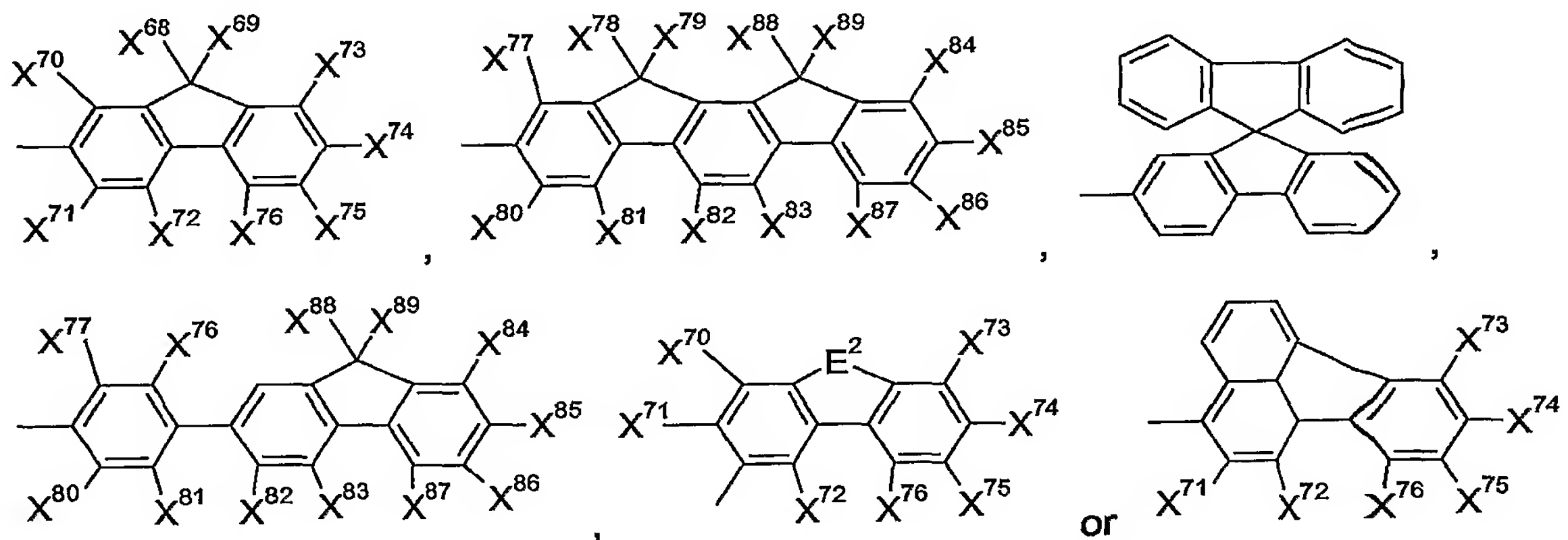
two groups X^{41} , X^{42} , X^{43} , X^{44} , X^{45} , X^{46} , X^{47} , X^{48} , X^{49} , X^{50} , X^{51} , X^{52} , X^{53} , X^{54} , X^{55} , X^{56} , X^{57} , X^{58} , X^{59} , X^{60} , X^{61} , X^{62} , X^{63} , X^{64} , X^{65} , X^{66} and X^{67} , which are neighbouring to each other,



are a group , or , wherein A^{90} , A^{91} , A^{92} , A^{93} , A^{94} , A^{95} , A^{96} and A^{97} are independently of each other H, halogen, hydroxy, C_1 - C_{24} alkyl, C_1 - C_{24} alkyl which

is substituted by E and/or interrupted by D, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or -NR²⁵-, C₅-C₁₂cycloalkoxy, C₅-C₁₂cycloalkoxy which is substituted by G, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, C₇-C₂₅aralkyl, which is substituted by G, C₇-C₂₅aralkoxy, C₇-C₂₅aralkoxy which is substituted by E, or -CO-R²⁸, wherein R²⁵, R²⁶ and R²⁸, D, E and G are as defined in claim 2 and preferably at least one of the substituents X⁴¹, X⁴², X⁴³, X⁴⁴, X⁴⁵, X⁴⁶, X⁴⁷, X⁴⁸, X⁴⁹, X⁵⁰, X⁵¹, X⁵², X⁵³, X⁵⁴, X⁵⁵, X⁵⁶, X⁵⁷, X⁵⁸, X⁵⁹, X⁶⁰, X⁶¹, X⁶², X⁶³, X⁶⁴, X⁶⁵, X⁶⁶ and X⁶⁷ is fluorine, -NR²⁵R²⁶, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or C₁-C₂₄haloalkyl.

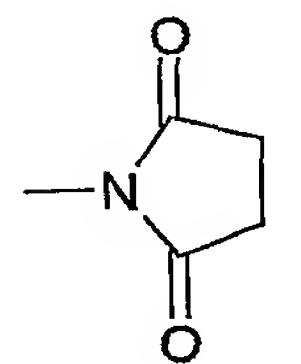
3. A 2H-benzotriazole compound according to claim 1, wherein at least one of the substituents A²¹, A²², A²³, A²⁴, A¹¹, A¹², A¹³, A¹⁴, A¹⁵, A¹⁶, A¹⁷ and A¹⁸, especially A¹² and/or A²³ are a group of formula



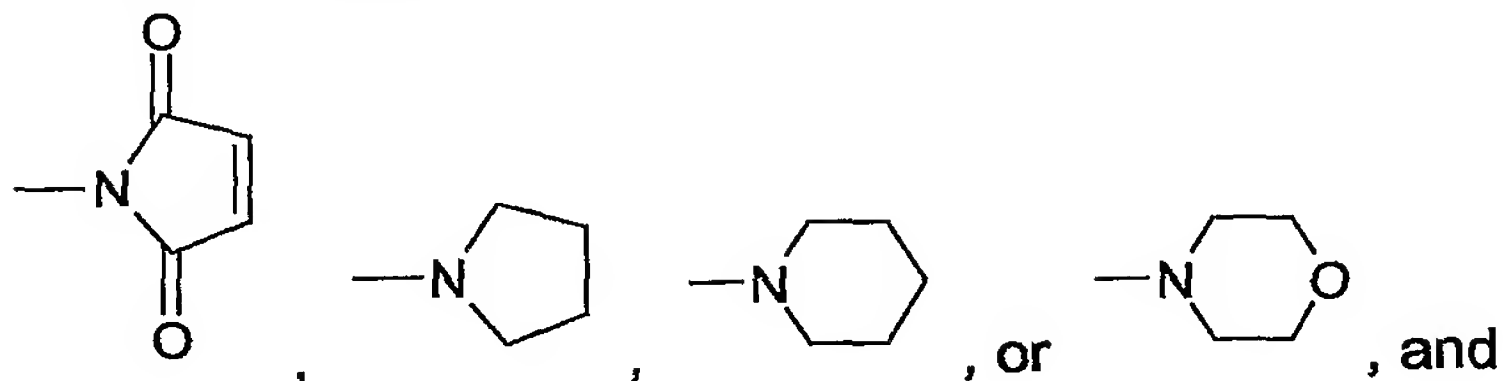
wherein

X⁶⁸, X⁶⁹, X⁷⁸, X⁷⁹, X⁸⁸ and X⁸⁹ are independently of each other C₁-C₂₄alkyl, especially C₁-C₁₂alkyl, which can be interrupted by one or two oxygen atoms, X⁷⁰, X⁷¹, X⁷², X⁷³, X⁷⁴, X⁷⁵, X⁷⁶, X⁷⁷, X⁸⁰, X⁸¹, X⁸², X⁸³, X⁸⁴, X⁸⁵, X⁸⁶ and X⁸⁷ are independently of each other H, CN, C₁-C₂₄alkyl, C₆-C₁₀aryl, C₁-C₂₄alkoxy, C₁-C₂₄alkylthio, -NR²⁵R²⁶, -CONR²⁵R²⁶, or -COOR²⁷, wherein

R²⁵ and R²⁶ are independently of each other H, C₆-C₁₈aryl, C₇-C₁₈aralkyl, or C₁-C₂₄alkyl, and R²⁷ is C₁-C₂₄alkyl, or

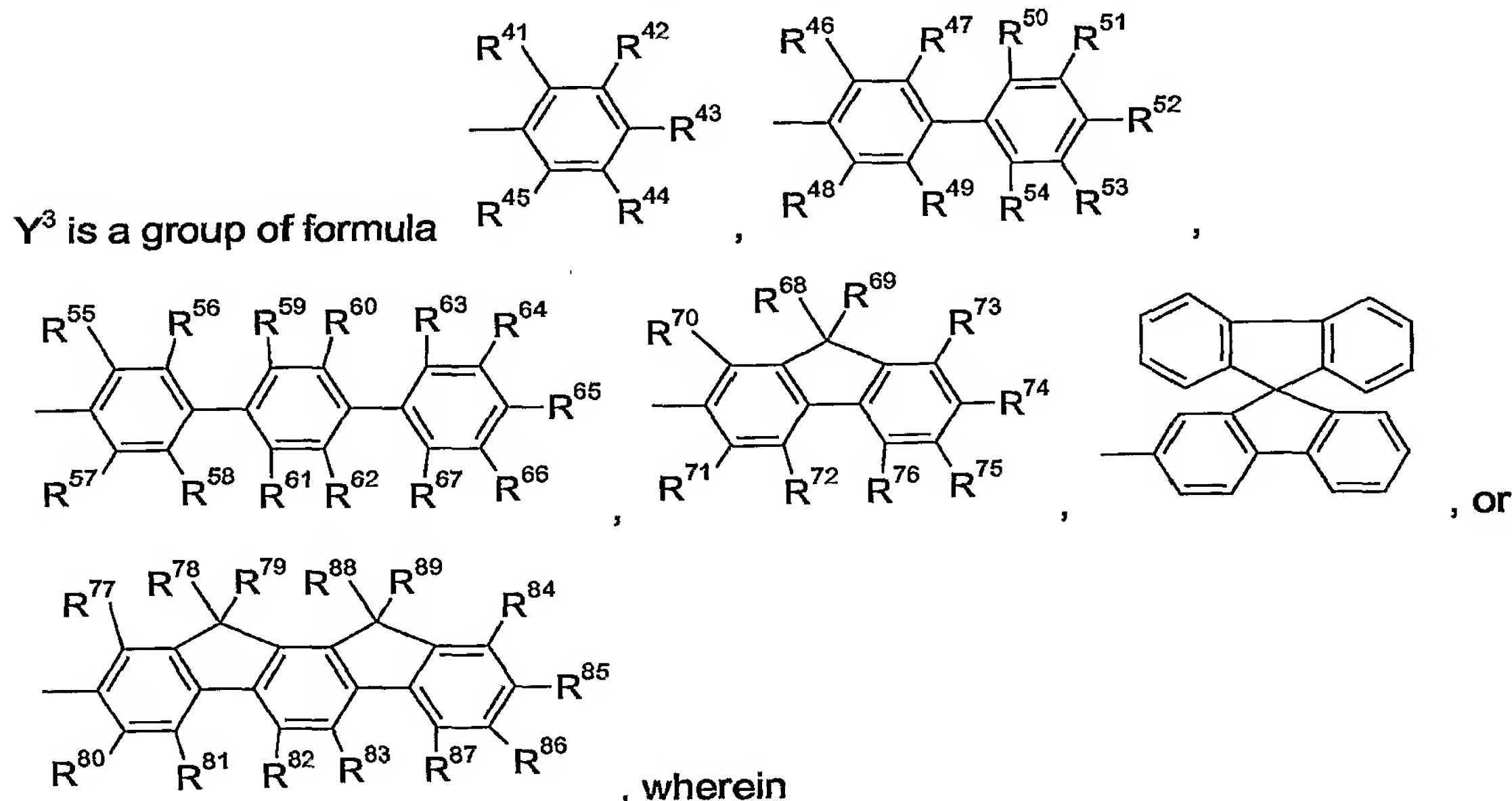


R^{25} and R^{26} together form a five or six membered ring, in particular



E^2 is -S-, -O-, or -NR^{25'}-, wherein $R^{25'}$ is C₁-C₂₄alkyl, or C₆-C₁₀aryl.

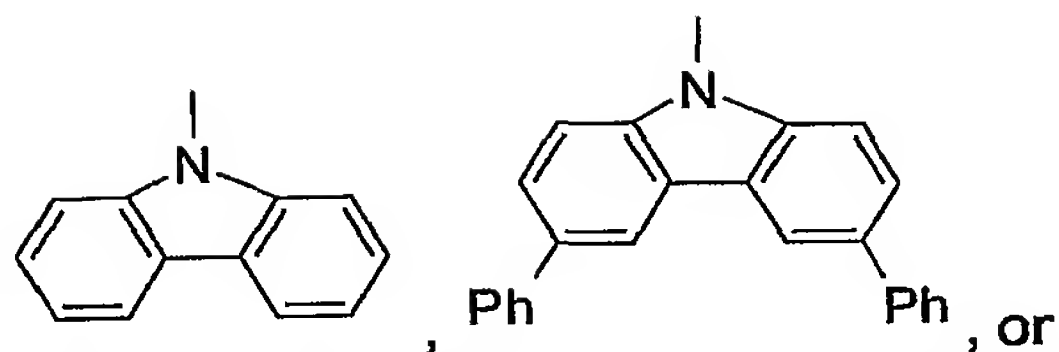
5 4. A 2H-benzotriazole compound according to claim 1, wherein



10 $R^{41}, R^{42}, R^{43}, R^{44}, R^{45}, R^{46}, R^{47}, R^{48}, R^{49}, R^{50}, R^{51}, R^{52}, R^{53}, R^{54}, R^{55}, R^{56}, R^{57}, R^{58}, R^{59}, R^{60}, R^{61}, R^{62}, R^{63}, R^{64}, R^{65}, R^{66}, R^{67}, R^{70}, R^{71}, R^{72}, R^{73}, R^{74}, R^{75}, R^{76}, R^{77}, R^{80}, R^{81}, R^{82}, R^{83}, R^{84}, R^{85}, R^{86}$, and R^{87} are independently of each other H, fluorine, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, -NR²⁵R²⁶, C₁-C₂₄alkyl, which is optionally substituted by E and/or interrupted by D, C₁-C₂₄alkenyl, which is optionally substituted by E, C₅-C₁₂cycloalkyl, which is optionally substituted by G, C₅-C₁₂cycloalkoxy, which is optionally substituted by G, C₆-C₁₈aryl, which is optionally substituted by G, C₁-C₂₄alkoxy, which is optionally substituted by E and/or interrupted by D, C₆-C₁₈aryloxy, which is optionally substituted by G, C₇-C₁₈arylalkoxy, which is optionally substituted by G, C₁-C₂₄alkylthio, which is optionally substituted by E and/or interrupted by D, C₂-C₂₀heteroaryl which is substituted by G, or C₆-C₁₈aralkyl, which is optionally substituted by G, or

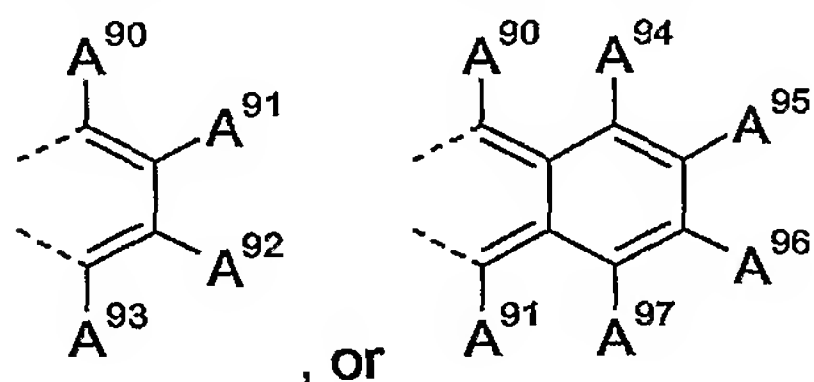
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R^{43} , R^{65} or R^{52} are a group of formula

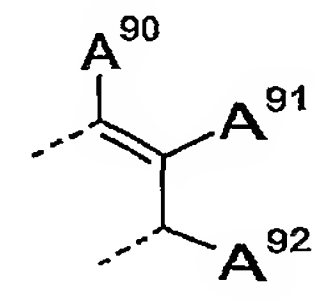
two groups R^{41} , R^{42} , R^{43} , R^{44} , R^{45} , R^{46} , R^{47} , R^{48} , R^{49} , R^{50} , R^{51} , R^{52} , R^{53} , R^{54} , R^{55} , R^{56} , R^{57} , R^{58} , R^{59} , R^{60} , R^{61} , R^{62} , R^{63} , R^{64} , R^{65} , R^{66} , R^{67} , R^{70} , R^{71} , R^{72} , R^{73} , R^{74} , R^{75} , R^{76} , R^{77} , R^{80} , R^{81} , R^{82} , R^{83} , R^{84} , R^{85} , R^{86} , and R^{87} , which are neighbouring to each other, are a group



, or , wherein A^{90} , A^{91} , A^{92} , A^{93} , A^{94} , A^{95} , A^{96} and A^{97} are independently of each other H, halogen, especially fluorine, $-NR^{25}R^{26}$, hydroxy, C_1 - C_{24} alkyl, C_1 - C_{24} alkyl which is substituted by E and/or interrupted by D, C_1 - C_{24} perfluoroalkyl, C_6 - C_{14} perfluoroaryl, especially pentafluorophenyl, C_5 - C_{12} cycloalkyl, C_5 - C_{12} cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or $-NR^{25}$ -, C_5 - C_{12} cycloalkoxy, C_5 - C_{12} cycloalkoxy which is substituted by G, C_6 - C_{24} aryl, C_6 - C_{24} aryl which is substituted by G, C_2 - C_{20} heteroaryl, C_2 - C_{20} heteroaryl which is substituted by G, C_2 - C_{24} alkenyl, C_2 - C_{24} alkynyl, C_1 - C_{24} alkoxy, C_1 - C_{24} alkoxy which is substituted by E and/or interrupted by D, C_7 - C_{25} aralkyl, C_7 - C_{25} aralkyl, which is substituted by G, C_7 - C_{25} aralkoxy, C_7 - C_{25} aralkoxy which is substituted by G, or $-CO-R^{28}$,

R^{68} , R^{69} , R^{78} , R^{79} , R^{88} and R^{89} are independently of each other C_1 - C_{18} alkyl, C_1 - C_{24} alkyl which is substituted by E and/or interrupted by D, C_6 - C_{24} aryl, C_6 - C_{24} aryl which is substituted by G, C_2 - C_{20} heteroaryl, C_2 - C_{20} heteroaryl which is substituted by G, C_2 - C_{24} alkenyl, C_2 - C_{24} alkynyl, C_1 - C_{24} alkoxy, C_1 - C_{24} alkoxy which is substituted by E and/or interrupted by D, or C_7 - C_{25} aralkyl, or

R^{68} and R^{69} , R^{78} and R^{79} , and/or R^{88} and R^{89} form a ring, especially a five- or six-membered ring, or

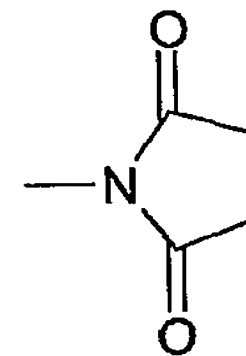


R^{68} and R^{70} , R^{69} and R^{73} , R^{77} and R^{78} and/or R^{84} and R^{89} are a group

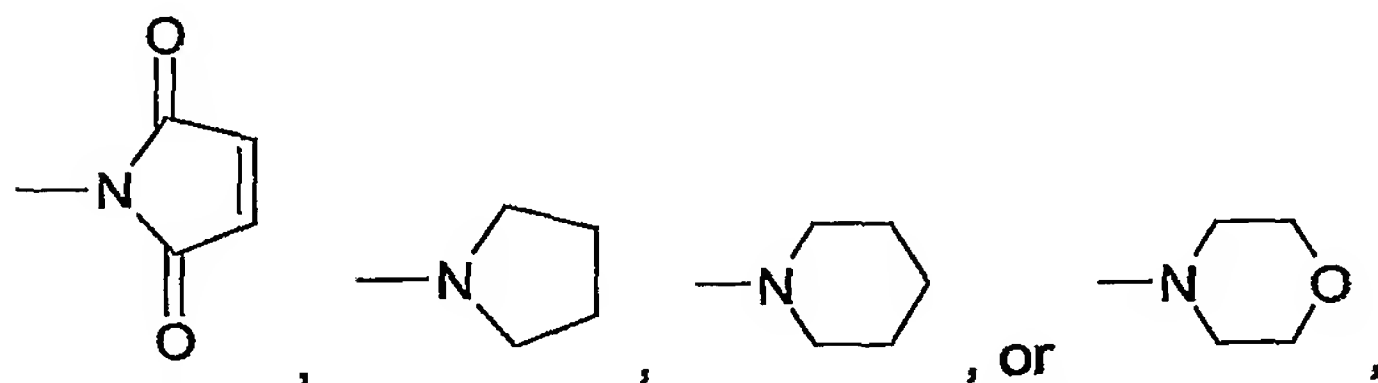
D is $-CO-$; $-COO-$; $-S-$; $-SO-$; $-SO_2-$; $-O-$; $-NR^{25}-$; $-SiR^{30}R^{31}-$; $-POR^{32}-$; $-CR^{23}=CR^{24}-$; or $-C\equiv C-$; and

E is $-OR^{29}$; $-SR^{29}$; $-NR^{25}R^{26}$; $-COR^{28}$; $-COOR^{27}$; $-CONR^{25}R^{26}$; $-CN$; $-OCOOR^{27}$; or halogen; G is E, or C_1 - C_{24} alkyl; wherein

R^{23} , R^{24} , R^{25} and R^{26} are independently of each other H; C_6-C_{18} aryl; C_6-C_{18} aryl which is substituted by C_1-C_{24} alkyl, or C_1-C_{24} alkoxy; C_1-C_{24} alkyl; or C_1-C_{24} alkyl which is interrupted by $-O-$; or



R^{25} and R^{26} together form a five or six membered ring, in particular

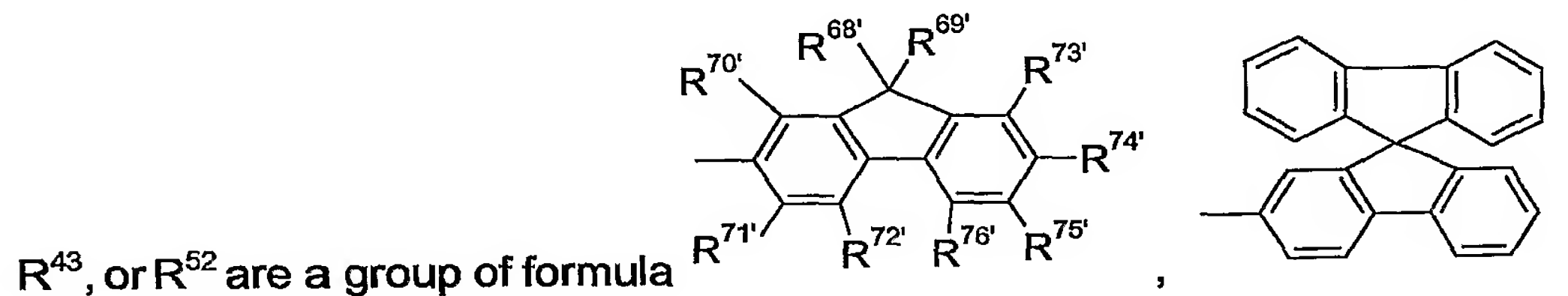


R^{27} and R^{28} are independently of each other H; C_6-C_{18} aryl; C_6-C_{18} aryl which is substituted by C_1-C_{24} alkyl, or C_1-C_{24} alkoxy; C_1-C_{24} alkyl; or C_1-C_{24} alkyl which is interrupted by $-O-$,

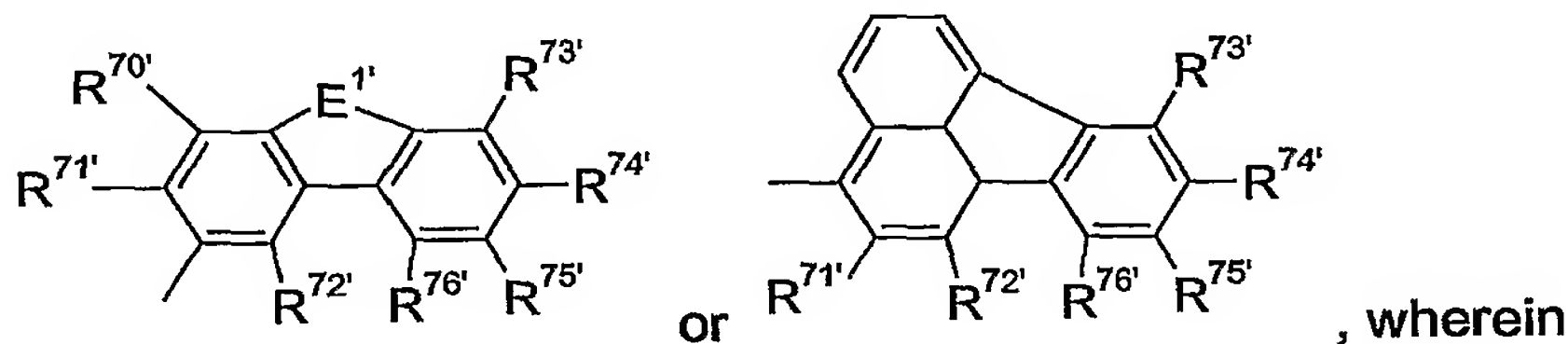
R^{29} is H; C_6-C_{18} aryl; C_6-C_{18} aryl, which is substituted by C_1-C_{24} alkyl, or C_1-C_{24} alkoxy; C_1-C_{24} alkyl; or C_1-C_{24} alkyl which is interrupted by $-O-$,

R^{30} and R^{31} are independently of each other C_1-C_{24} alkyl, C_6-C_{18} aryl, or C_6-C_{18} aryl, which is substituted by C_1-C_{24} alkyl, and

R^{32} is C_1-C_{24} alkyl, C_6-C_{18} aryl, or C_6-C_{18} aryl, which is substituted by C_1-C_{24} alkyl, or



R^{43} , or R^{52} are a group of formula



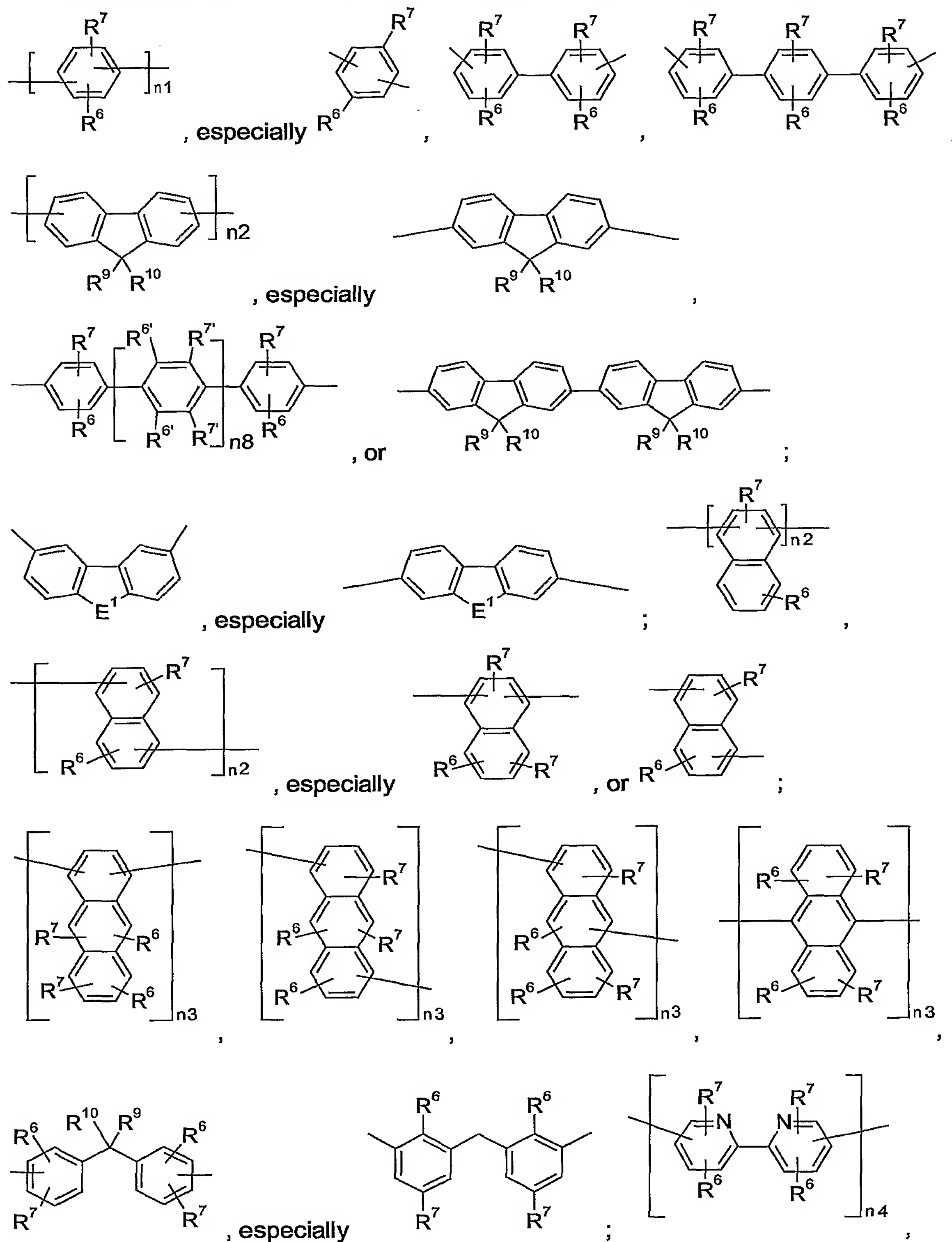
$R^{68'}$ and $R^{69'}$ are independently of each other C_1-C_{24} alkyl, especially C_1-C_{12} alkyl, which can be interrupted by one or two oxygen atoms,

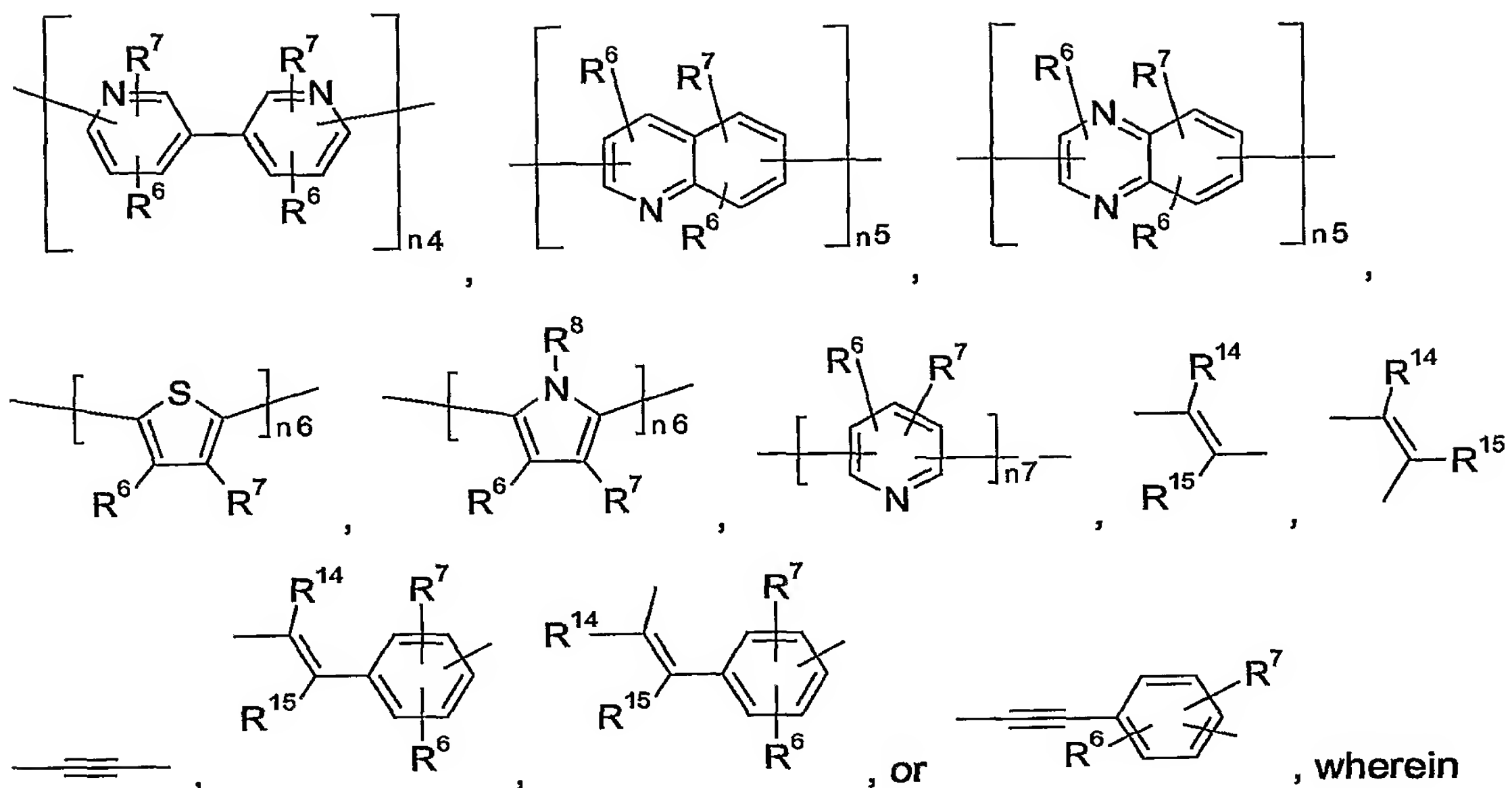
$R^{70'}$, $R^{71'}$, $R^{72'}$, $R^{73'}$, $R^{74'}$, $R^{75'}$ and $R^{76'}$ are independently of each other H, CN, C_1-C_{24} alkyl, C_6-C_{10} aryl, C_1-C_{24} alkoxy, C_1-C_{24} alkylthio, $-NR^{25'}R^{26'}$, $-CONR^{25'}R^{26'}$, or $-COOR^{27'}$,

$R^{25'}$ and $R^{26'}$ are independently of each other H, C_6-C_{18} aryl, C_7-C_{18} aralkyl, or C_1-C_{24} alkyl, and $R^{27'}$ is C_1-C_{24} alkyl; and

E^1 is $-S-$, $-O-$, or $-NR^{25'}$, wherein $R^{25'}$ is C_1-C_{24} alkyl, or C_6-C_{10} aryl.

5. A 2H-benzotriazole compound to claim 1, wherein Y^1 is a group of formula

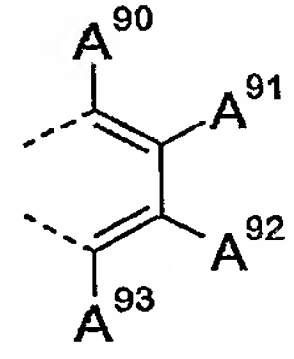




$n_1, n_2, n_3, n_4, n_5, n_6, n_7$ and n_8 are 1, 2, or 3, in particular 1,

E^1 is -S-, -O-, or -NR^{25'}-, wherein R^{25'} is C₁-C₂₄alkyl, or C₆-C₁₀aryl,

R⁶ and R⁷ are independently of each other H, halogen, especially fluorine, -NR²⁵R²⁶, hydroxy, C₁-C₂₄alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or -NR²⁵-, C₅-C₁₂cycloalkoxy, C₅-C₁₂cycloalkoxy which is substituted by G, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, C₇-C₂₅aralkyl, C₇-C₂₅aralkyl, which is substituted by G, C₇-C₂₅aralkoxy, C₇-C₂₅aralkoxy which is substituted by G, or -CO-R²⁸,

R^{6'} and R^{7'} have the meaning of R⁶, or together form a group , wherein A⁹⁰, A⁹¹, A⁹², and A⁹³ are independently of each other H, halogen, hydroxy, C₁-C₂₄alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl which is substituted by G and/or interrupted by S-, -O-, or -NR²⁵-, C₅-C₁₂cycloalkoxy, C₅-C₁₂cycloalkoxy which is substituted by G, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by

D, C₇-C₂₅aralkyl, C₇-C₂₅aralkyl, which is substituted by G, C₇-C₂₅aralkoxy, C₇-C₂₅aralkoxy which is substituted by E, or -CO-R²⁸,

R⁸ is C₁-C₂₄alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, or C₇-C₂₅aralkyl,

5 R⁹ and R¹⁰ are independently of each other C₁-C₂₄alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, C₂-C₂₀heteroaryl which is substituted by G, C₂-C₂₄alkenyl, C₂-C₂₄alkynyl, C₁-C₂₄alkoxy, C₁-C₂₄alkoxy which is substituted by E and/or interrupted by D, or C₇-C₂₅aralkyl, or

10 R⁹ and R¹⁰ form a ring, especially a five- or six-membered ring,

R¹⁴ and R¹⁵ are independently of each other H, C₁-C₂₄alkyl, C₁-C₂₄alkyl which is substituted by E and/or interrupted by D, C₆-C₂₄aryl, C₆-C₂₄aryl which is substituted by G, C₂-C₂₀heteroaryl, or C₂-C₂₀heteroaryl which is substituted by G,

D is -CO-, -COO-, -S-, -SO-, -SO₂-, -O-, -NR²⁵-, -SiR³⁰R³¹-, -POR³²-, -CR²³=CR²⁴-, or -

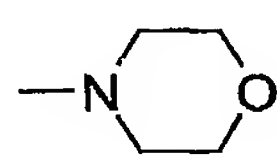
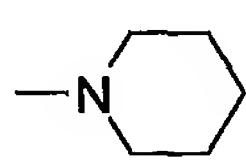
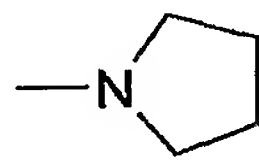
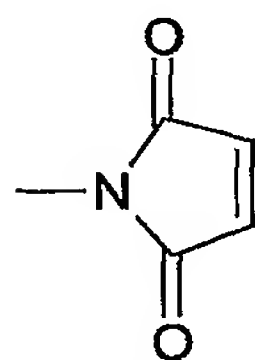
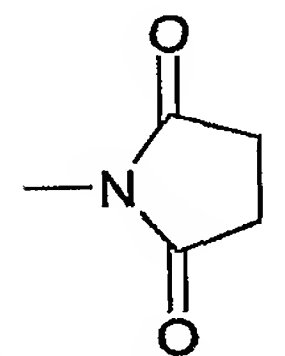
15 C≡C-, G is E, or C₁-C₂₄alkyl, and

E is -OR²⁹-, -SR²⁹-, -NR²⁵R²⁶-, -COR²⁸-, -COOR²⁷-, -CONR²⁵R²⁶-, -CN, -OCOOR²⁷-, or halogen, wherein

R²³, R²⁴, R²⁵ and R²⁶ are independently of each other H, C₆-C₁₈aryl, C₆-C₁₈aryl which is substituted by C₁-C₂₄alkyl, C₁-C₂₄alkoxy, C₁-C₂₄alkyl, or C₁-C₂₄alkyl which is interrupted by -O-, or

20

R²⁵ and R²⁶ together form a five or six membered ring, in particular



,

,

, or

,

R²⁷ and R²⁸ are independently of each other H, C₆-C₁₈aryl, C₆-C₁₈aryl which is substituted by C₁-C₂₄alkyl, or C₁-C₂₄alkoxy, C₁-C₂₄alkyl, or C₁-C₂₄alkyl which is interrupted by -O-,

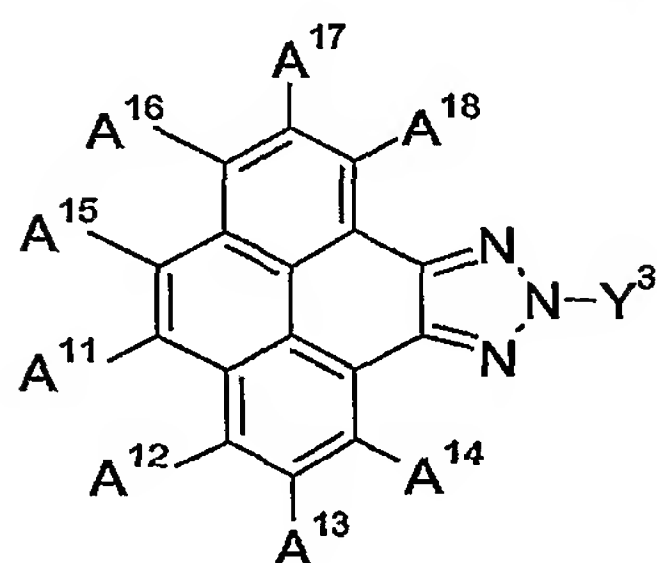
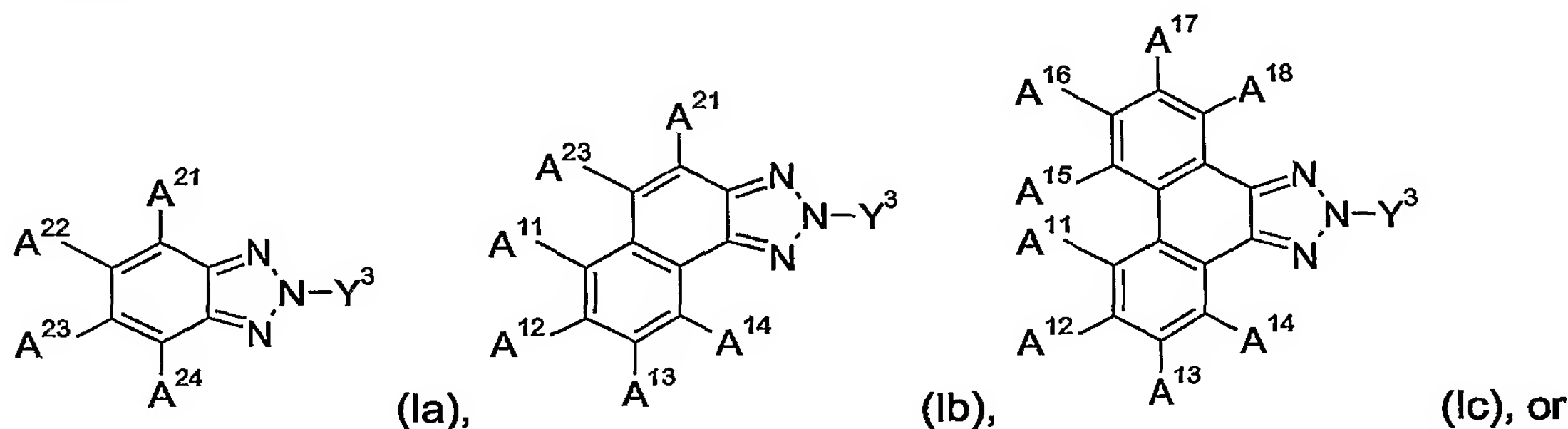
25

R²⁹ is H, C₆-C₁₈aryl, C₆-C₁₈aryl, which is substituted by C₁-C₂₄alkyl, C₁-C₂₄alkoxy, C₁-C₂₄alkyl, or C₁-C₂₄alkyl which is interrupted by -O-,

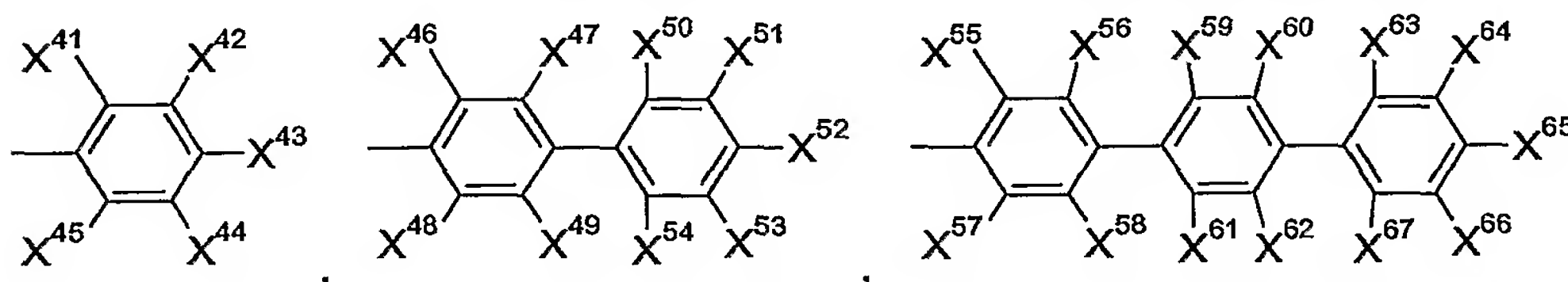
R³⁰ and R³¹ are independently of each other C₁-C₂₄alkyl, C₆-C₁₈aryl, or C₆-C₁₈aryl, which is substituted by C₁-C₂₄alkyl, and

R^{32} is C_1 - C_{24} alkyl, C_6 - C_{18} aryl, or C_6 - C_{18} aryl, which is substituted by C_1 - C_{24} alkyl.

6. A 2H-benzotriazole compound to claim 1, wherein the 2H-benzotriazole compound is a compound of formula



(ld), wherein A^{12} or A^{23} are a group of formula


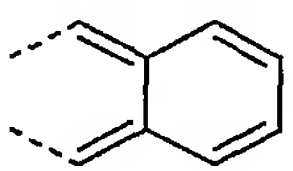


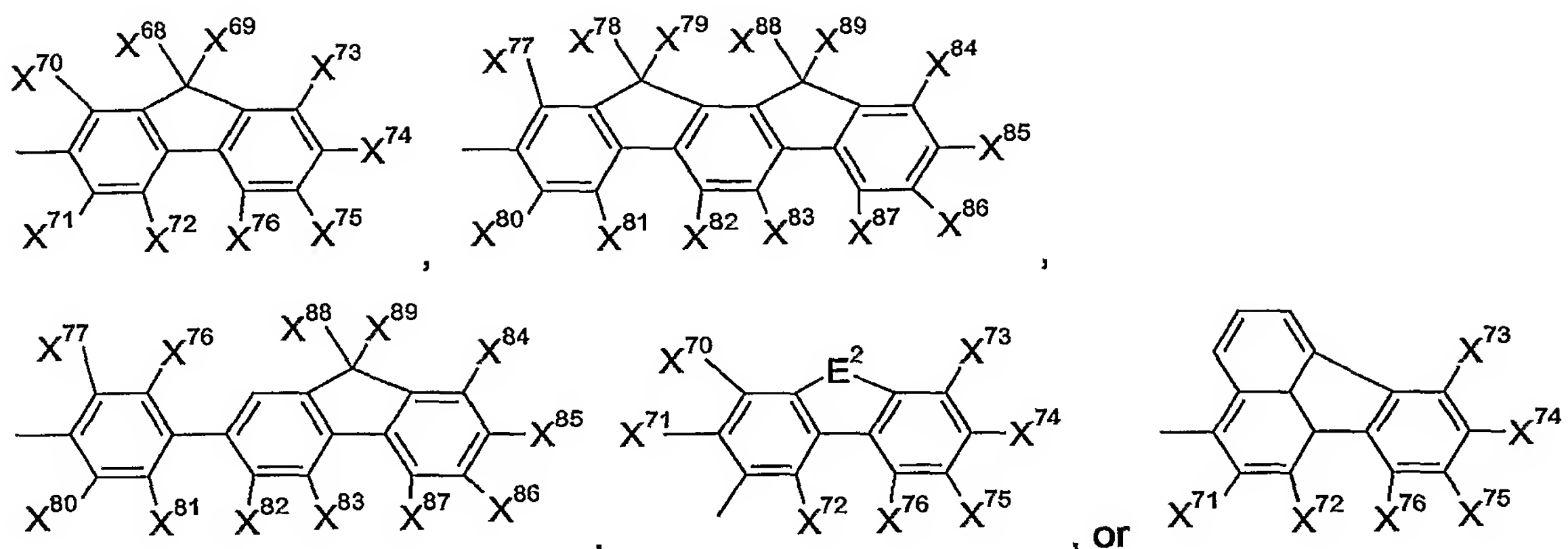
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15

, wherein X^{41} , X^{42} , X^{43} , X^{44} , X^{45} , X^{46} , X^{47} , X^{48} , X^{49} , X^{50} , X^{51} , X^{52} , X^{53} , X^{54} , X^{55} , X^{56} , X^{57} , X^{58} , X^{59} , X^{60} , X^{61} , X^{62} , X^{63} , X^{64} , X^{65} , X^{66} and X^{67} are independently of each other are independently of each other H, CN, fluorine, C_1 - C_{24} alkyl, C_5 - C_{12} cycloalkyl, C_7 - C_{25} aralkyl, C_1 - C_{24} perfluoroalkyl, C_6 - C_{14} perfluoroaryl, especially pentafluorophenyl, C_1 - C_{24} haloalkyl, C_6 - C_{10} aryl, which can optionally be substituted by one, or more C_1 - C_8 alkyl, or C_1 - C_8 alkoxy groups; C_1 - C_{24} alkoxy, C_1 - C_{24} alkylthio, $-NR^{25}R^{26}$, $-CONR^{25}R^{26}$, or $-COOR^{27}$, or two groups X^{41} , X^{42} , X^{43} , X^{44} , X^{45} , X^{46} , X^{47} , X^{48} , X^{49} , X^{50} , X^{51} , X^{52} , X^{53} , X^{54} , X^{55} , X^{56} , X^{57} , X^{58} , X^{59} , X^{60} , X^{61} , X^{62} , X^{63} , X^{64} , X^{65} , X^{66} and X^{67} , which are neighbouring to each other,

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are a group , or , wherein preferably at least one of the substituents X^{41} , X^{42} , X^{43} , X^{44} , X^{45} , X^{46} , X^{47} , X^{48} , X^{49} , X^{50} , X^{51} , X^{52} , X^{53} , X^{54} , X^{55} , X^{56} , X^{57} , X^{58} , X^{59} , X^{60} , X^{61} , X^{62} , X^{63} , X^{64} , X^{65} , X^{66} and X^{67} is fluorine, $-NR^{25}R^{26}$, C_1 - C_{24} alkyl, C_5 - C_{12} cycloalkyl, C_7 - C_{25} aralkyl, C_1 - C_{24} perfluoroalkyl, C_6 - C_{14} perfluoroaryl, especially pentafluorophenyl, or C_1 - C_{24} haloalkyl, or A^{12} and A^{23} are a group of formula



wherein

X⁶⁸, X⁶⁹, X⁷⁸, X⁷⁹, X⁸⁸ and X⁸⁹ are independently of each other C₁-C₂₄alkyl, especially

C₁-C₁₂alkyl, which can be interrupted by one or two oxygen atoms,

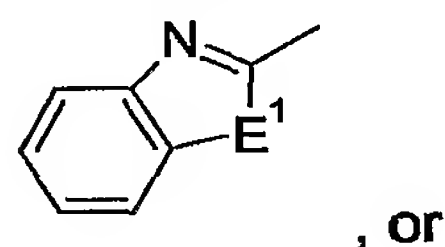
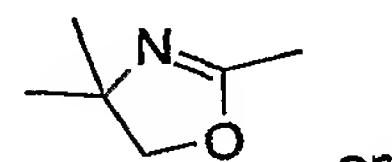
X⁷⁰, X⁷¹, X⁷², X⁷³, X⁷⁴, X⁷⁵, X⁷⁶, X⁷⁷, X⁸⁰, X⁸¹, X⁸², X⁸³, X⁸⁴, X⁸⁵, X⁸⁶ and X⁸⁷ are

independently of each other H, CN, C₁-C₂₄alkyl, C₆-C₁₀aryl, which can optionally be substituted by one, or more C₁-C₈alkyl, or C₁-C₈alkoxy groups; C₁-C₂₄alkoxy, C₁-C₂₄alkylthio, -NR²⁵R²⁶, -CONR²⁵R²⁶, or -COOR²⁷,

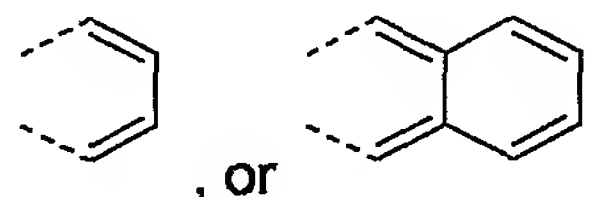
E² is -S-, -O-, or -NR^{25'}-, wherein R^{25'} is C₁-C₂₄alkyl, or C₆-C₁₀aryl,

A²¹, A²² and A²⁴ are independently of each other hydrogen, halogen, especially fluorine, C₁-C₂₄alkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄haloalkyl, C₆-C₁₈aryl, which can optionally be substituted by one, or more C₁-C₈alkyl, or C₁-C₈alkoxy groups; -NR²⁵R²⁶, -CONR²⁵R²⁶,

or -COOR²⁷, or C₂-C₁₀heteroaryl, especially a group of formula



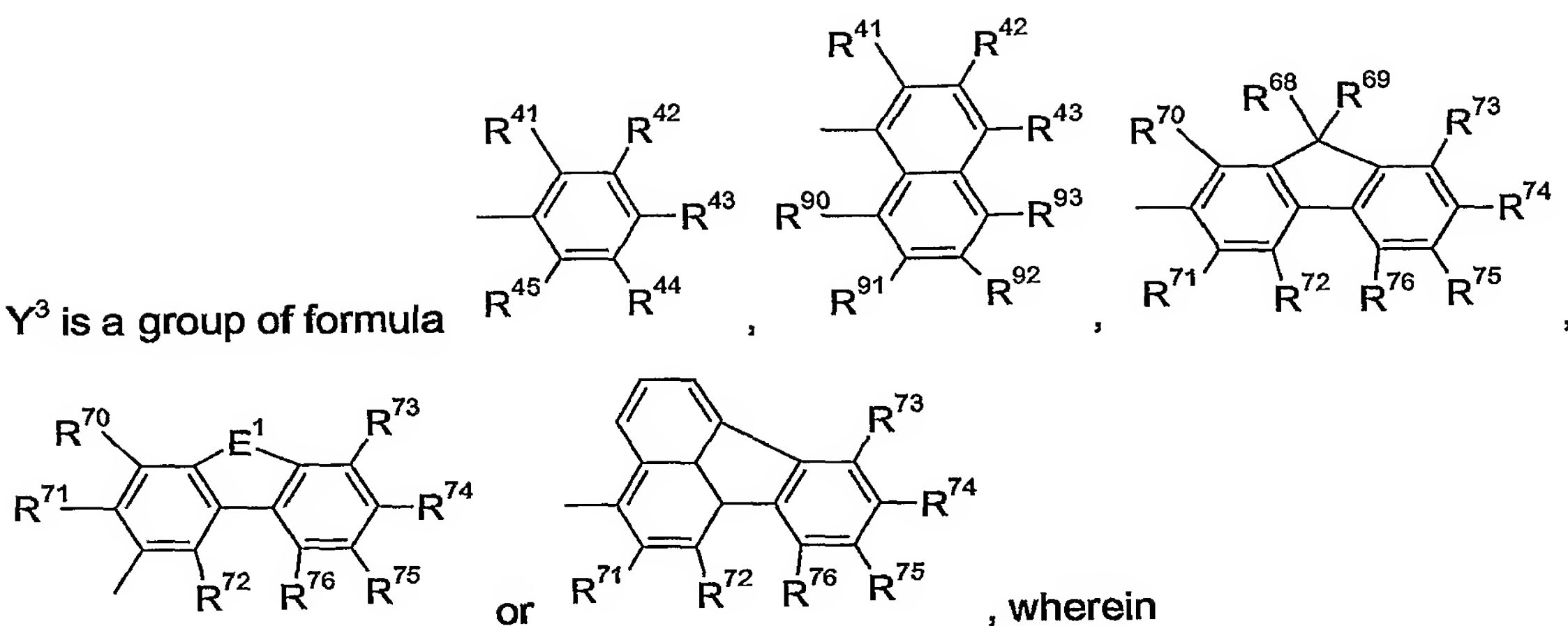
A²² and A²³ or A¹¹ and A²³ are a group of formula



A¹¹, A¹³, A¹⁴, A¹⁵, A¹⁶, A¹⁷, and A¹⁸ are independently of each other H, CN, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₁-C₂₄haloalkyl, C₁-C₂₄alkoxy, C₁-C₂₄alkylthio, C₆-C₁₈aryl, -NR²⁵R²⁶, -CONR²⁵R²⁶, or -COOR²⁷, or C₂-C₁₀heteroaryl, wherein

R²⁵ and R²⁶ are independently of each other H, C₆-C₁₈aryl, C₇-C₁₈aralkyl, or C₁-C₂₄alkyl, R²⁷ is C₁-C₂₄alkyl, and

Y^3 is a group of formula

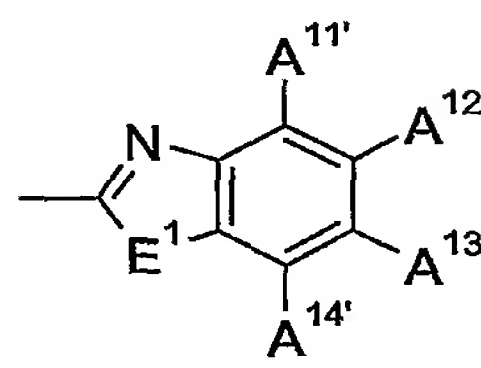


R^{41} is hydrogen, C_1 - C_{24} alkoxy, or $-OC_7$ - C_{18} aralkyl,

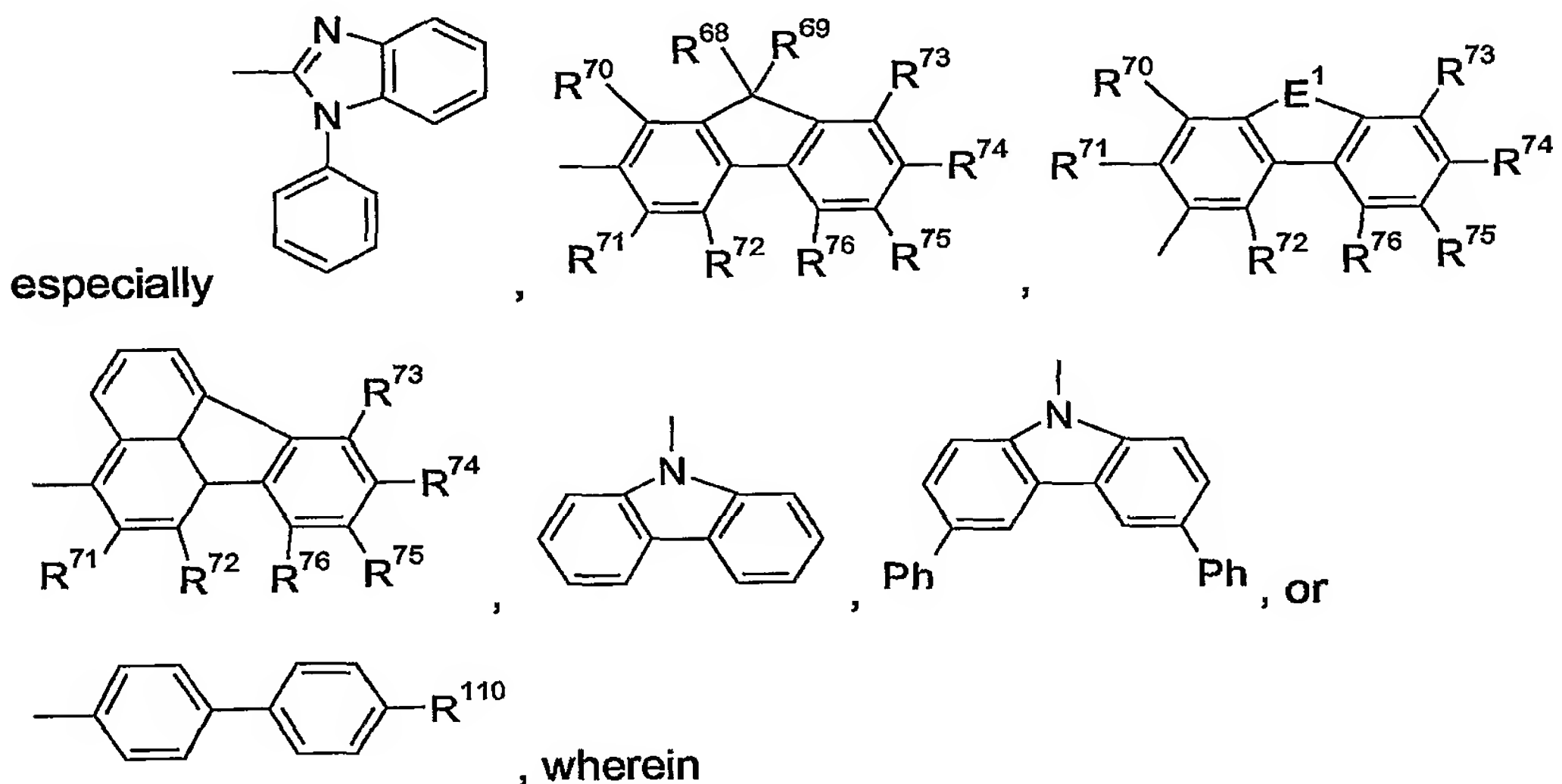
R^{42} is hydrogen, or C_1 - C_{24} alkyl,

5

R^{43} is hydrogen, halogen, $-\text{CONR}^{25}\text{R}^{26}$, $-\text{COOR}^{27}$,



especially

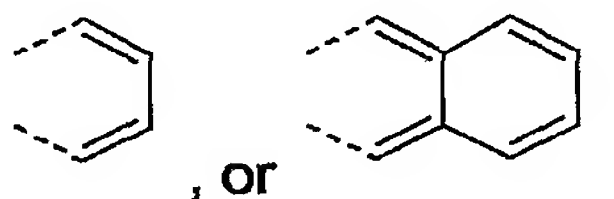


$A^{11'}$, $A^{12'}$, $A^{13'}$, and $A^{14'}$ are independently of each other H, CN, C_1 - C_{24} alkyl, C_1 - C_{24} alkoxy, C_1 - C_{24} alkylthio, $-\text{NR}^{25}\text{R}^{26}$, $-\text{CONR}^{25}\text{R}^{26}$, or $-\text{COOR}^{27}$,

E^1 is $-\text{S}-$, $-\text{O}-$, or $-\text{NR}^{25}-$, wherein $R^{25'}$ is C_1 - C_{24} alkyl, or C_6 - C_{10} aryl,

R^{110} is H, CN, C_1 - C_{24} alkyl, C_1 - C_{24} alkoxy, C_1 - C_{24} alkylthio, $-\text{NR}^{25}\text{R}^{26}$, $-\text{CONR}^{25}\text{R}^{26}$, or $-\text{COOR}^{27}$, or

R^{42} and R^{43} are a group of formula



R^{44} is hydrogen, or C_1 - C_{24} alkyl,

15

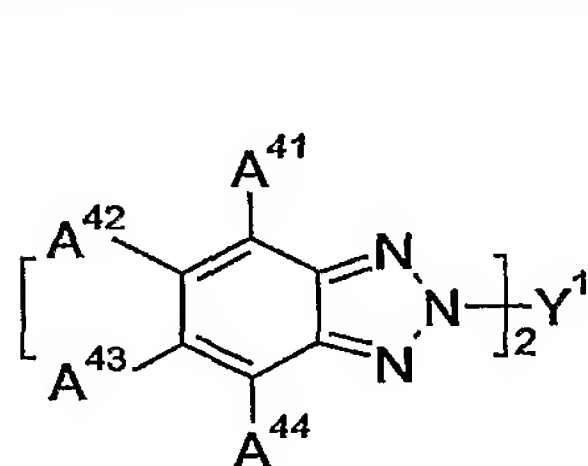
R^{45} is hydrogen, or C_1 - C_{24} alkyl,

R^{68} and R^{69} are independently of each other C_1 - C_{24} alkyl, especially C_1 - C_{12} alkyl, which can be interrupted by one or two oxygen atoms,

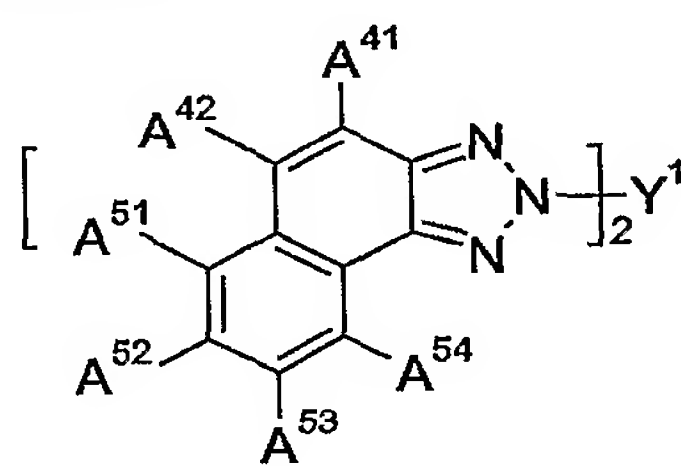
R^{70} , R^{71} , R^{72} , R^{73} , R^{74} , R^{75} , R^{76} , R^{90} , R^{91} , R^{92} , and R^{93} are independently of each other H, CN, C_1 - C_{24} alkyl, C_6 - C_{10} aryl, C_1 - C_{24} alkoxy, C_1 - C_{24} alkylthio, $-NR^{25}R^{26}$, $-CONR^{25}R^{26}$, or $-COOR^{27}$,

R^{25} and R^{26} are independently of each other H, C_6 - C_{18} aryl, C_7 - C_{18} aralkyl, or C_1 - C_{24} alkyl, and R^{27} is C_1 - C_{24} alkyl.

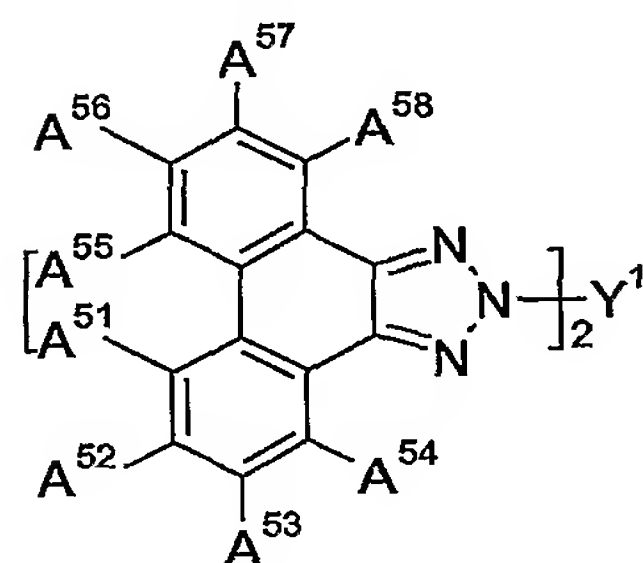
- 10 7. A 2H-benzotriazole compound according to claim 1, wherein the 2H-benzotriazole compound is a compound of formula



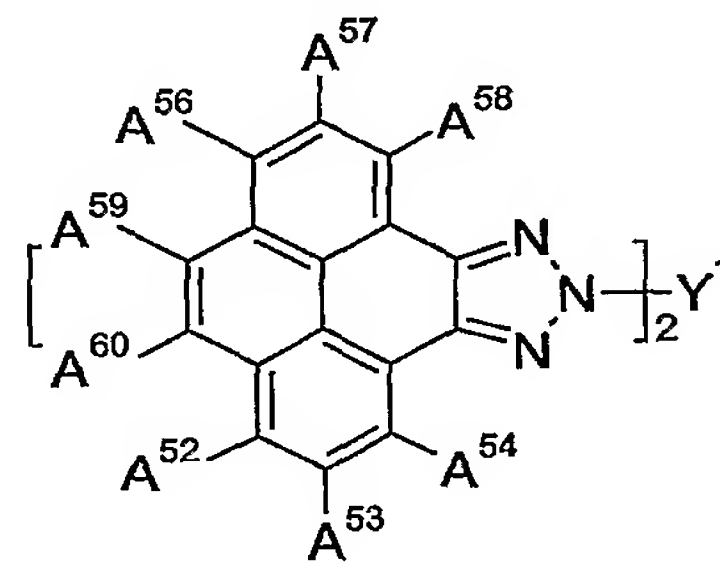
(IIa),



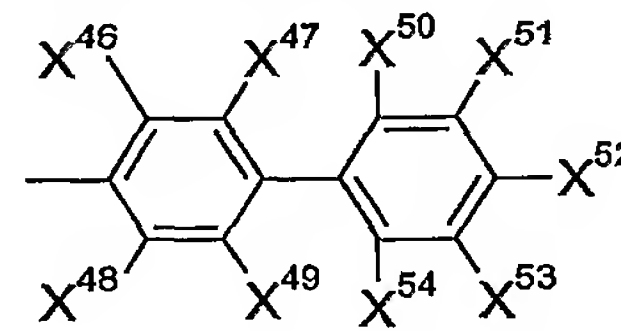
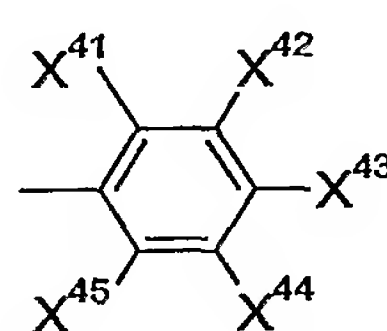
(IIb),



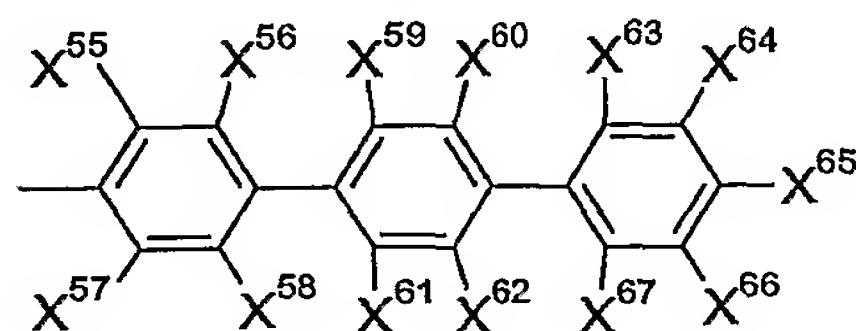
(IIc), or



(IId), wherein



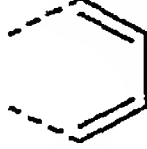
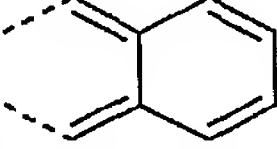
wherein A^{52} and A^{43} are a group of formula

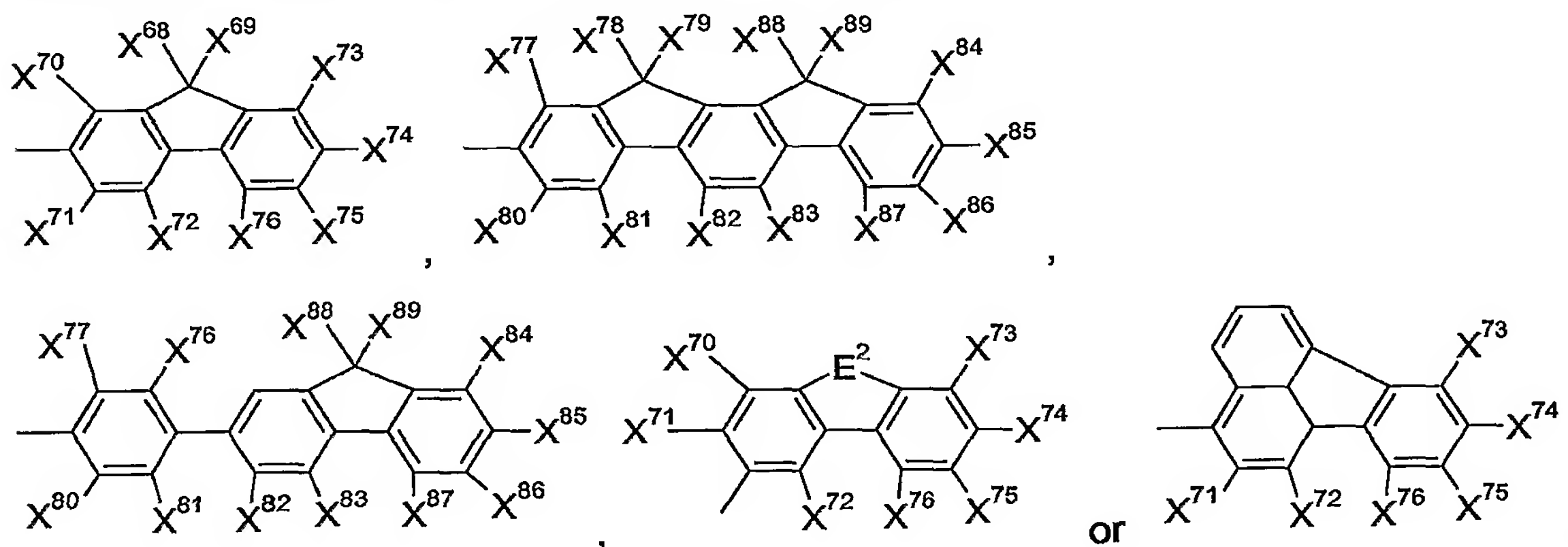


, wherein X^{41} , X^{42} , X^{43} , X^{44} , X^{45} , X^{46} , X^{47} , X^{48} , X^{49} , X^{50} ,

X^{51} , X^{52} , X^{53} , X^{54} , X^{55} , X^{56} , X^{57} , X^{58} , X^{59} , X^{60} , X^{61} , X^{62} , X^{63} , X^{64} , X^{65} , X^{66} and X^{67} are independently of each other H, fluorine, CN, C_1 - C_{24} alkyl, C_5 - C_{12} cycloalkyl, C_7 - C_{25} aralkyl, C_1 - C_{24} perfluoroalkyl, C_6 - C_{14} perfluoroaryl, especially pentafluorophenyl, or C_1 - C_{24} haloalkyl, C_6 - C_{10} aryl, which can optionally be substituted by one, or more C_1 - C_8 alkyl, or C_1 - C_8 alkoxy groups;

C₁-C₂₄alkoxy, C₁-C₂₄alkylthio, -NR²⁵R²⁶, -CONR²⁵R²⁶, or -COOR²⁷, or
 two groups X⁴¹, X⁴², X⁴³, X⁴⁴, X⁴⁵, X⁴⁶, X⁴⁷, X⁴⁸, X⁴⁹, X⁵⁰, X⁵¹, X⁵², X⁵³, X⁵⁴, X⁵⁵, X⁵⁶, X⁵⁷,
 X⁵⁸, X⁵⁹, X⁶⁰, X⁶¹, X⁶², X⁶³, X⁶⁴, X⁶⁵, X⁶⁶ and X⁶⁷, which are neighbouring to each other,

are a group , or , wherein preferably at least one of the substituents
 5 X⁴¹, X⁴², X⁴³, X⁴⁴, X⁴⁵, X⁴⁶, X⁴⁷, X⁴⁸, X⁴⁹, X⁵⁰, X⁵¹, X⁵², X⁵³, X⁵⁴, X⁵⁵, X⁵⁶, X⁵⁷, X⁵⁸, X⁵⁹, X⁶⁰,
 X⁶¹, X⁶², X⁶³, X⁶⁴, X⁶⁵, X⁶⁶ and X⁶⁷ is fluorine, -NR²⁵R²⁶, C₁-C₂₄alkyl, C₅-C₁₂cycloalkyl, C₇-
 C₂₅aralkyl, C₁-C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, or
 C₁-C₂₄haloalkyl, or A⁴³ or A⁵² are a group of formula



wherein

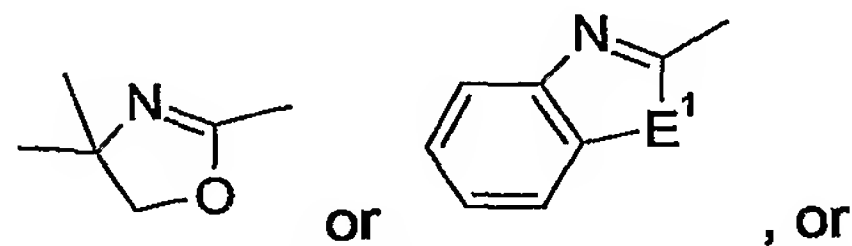
X⁶⁸, X⁶⁹, X⁷⁸, X⁷⁹, X⁸⁸ and X⁸⁹ are independently of each other C₁-C₂₄alkyl, especially
 C₁-C₁₂alkyl, which can be interrupted by one or two oxygen atoms,

15 X⁷⁰, X⁷¹, X⁷², X⁷³, X⁷⁴, X⁷⁵, X⁷⁶, X⁷⁷, X⁸⁰, X⁸¹, X⁸², X⁸³, X⁸⁴, X⁸⁵, X⁸⁶ and X⁸⁷ are
 independently of each other H, CN, C₁-C₂₄alkyl, C₆-C₁₀aryl, C₁-C₂₄alkoxy, C₁-
 C₂₄alkylthio, -NR²⁵R²⁶, -CONR²⁵R²⁶, or -COOR²⁷,

E² is -S-, -O-, or -NR^{25'}-,

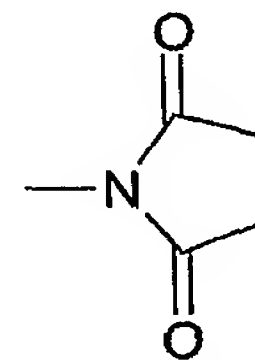
20 A⁴¹, A⁴² and A⁴⁴ are independently of each other hydrogen, halogen, C₁-C₂₄alkyl, C₁-
 C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₅-C₁₂cycloalkyl,
 C₇-C₂₅aralkyl, C₁-C₂₄haloalkyl, C₆-C₁₈aryl, -NR²⁵R²⁶, -CONR²⁵R²⁶, or -COOR²⁷, or C₂-

C₁₀heteroaryl, especially a group of formula

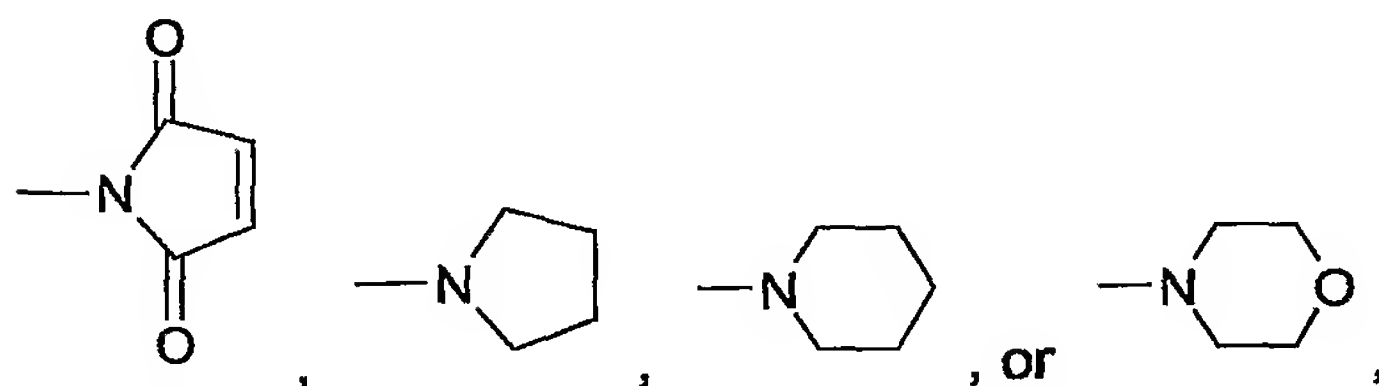


25 A⁵¹, A⁵³, A⁵⁴, A⁵⁵, A⁵⁶, A⁵⁷, A⁵⁸, A⁵⁹ and A⁶⁰ are independently of each other H, fluorine,
 CN, C₁-C₂₄alkyl, C₁-C₂₄alkoxy, C₁-C₂₄alkylthio, C₅-C₁₂cycloalkyl, C₇-C₂₅aralkyl, C₁-
 C₂₄perfluoroalkyl, C₆-C₁₄perfluoroaryl, especially pentafluorophenyl, C₁-C₂₄haloalkyl,
 C₆-C₁₈aryl, -NR²⁵R²⁶, -CONR²⁵R²⁶, or -COOR²⁷, or C₂-C₁₀heteroaryl, wherein E¹ is O, S,
 or -NR^{25'}-,

R^{25} and R^{26} are independently of each other H, C_6 - C_{18} aryl, C_7 - C_{18} aralkyl, or C_1 - C_{24} alkyl,

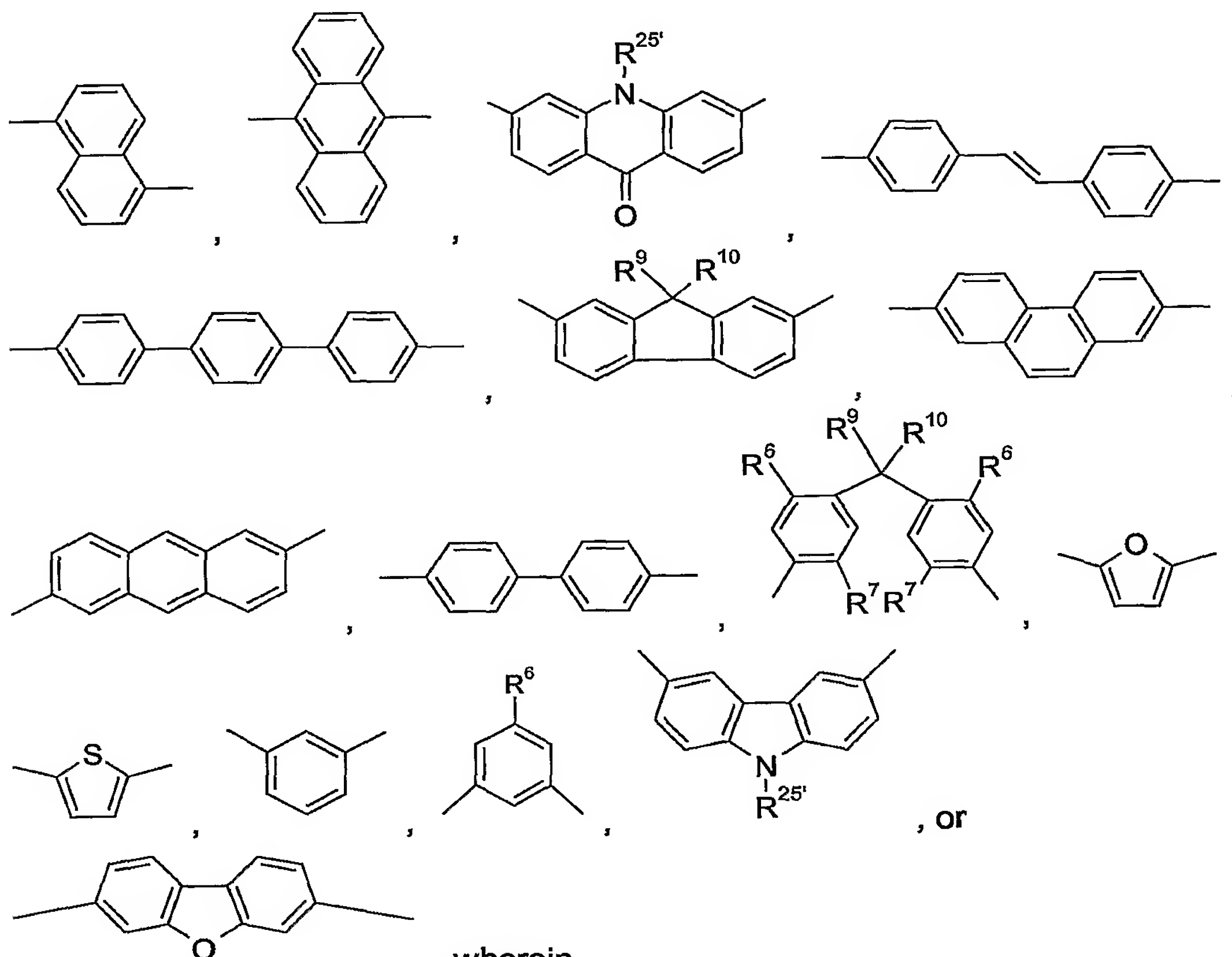


or R^{25} and R^{26} together form a five or six membered ring, in particular



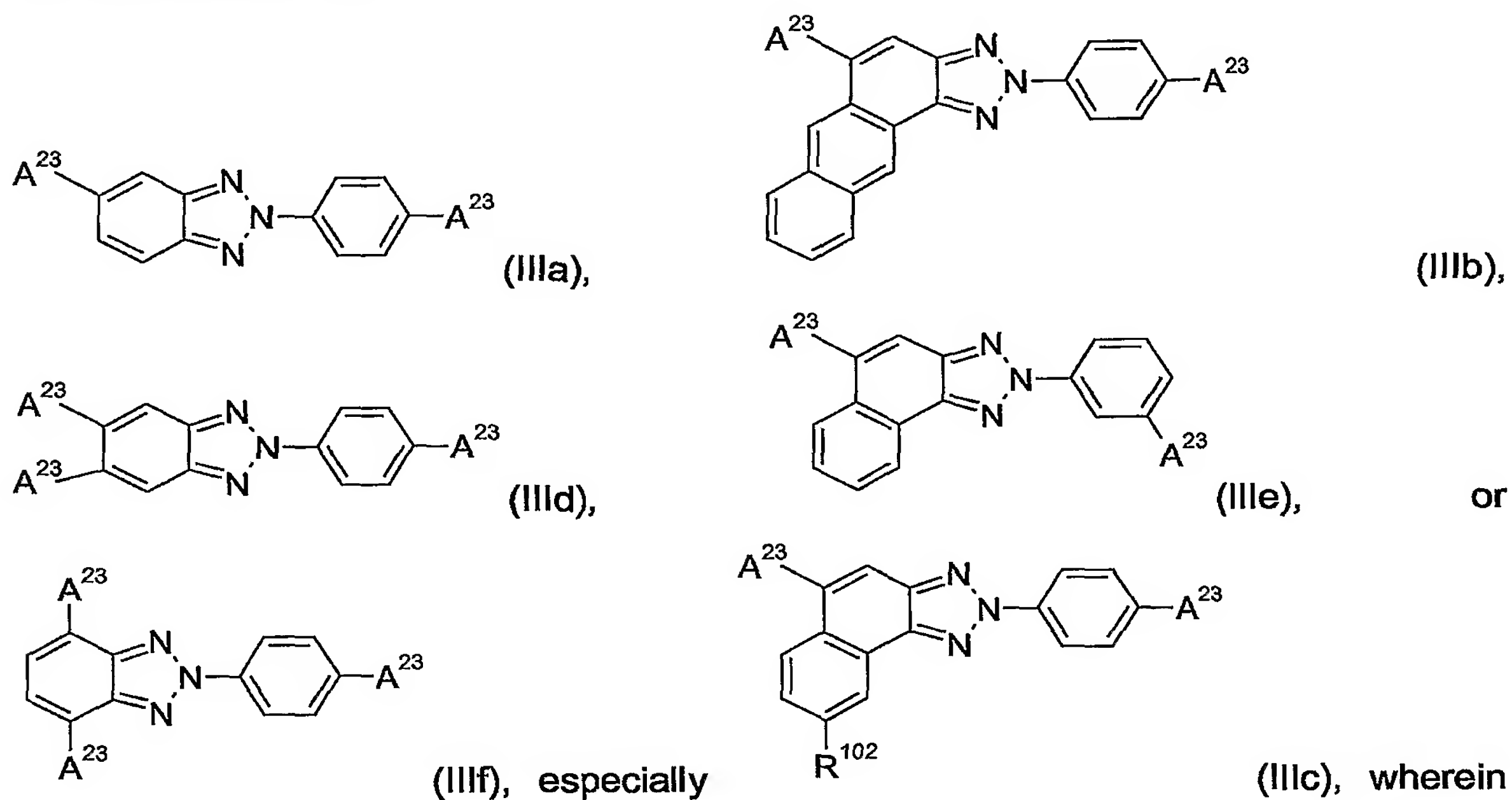
R^{27} is C_1 - C_{24} alkyl, and

Y^1 is a group of formula

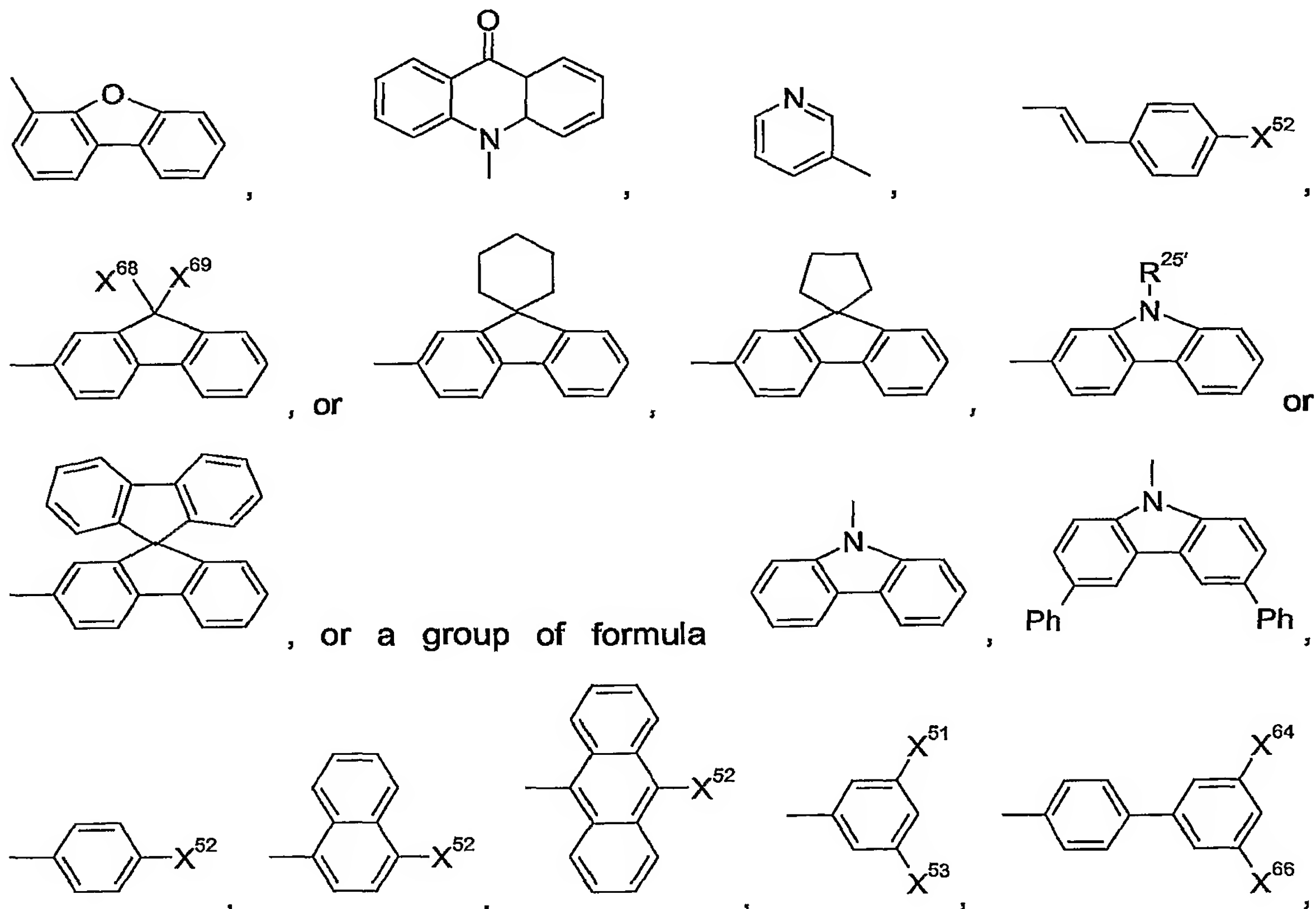


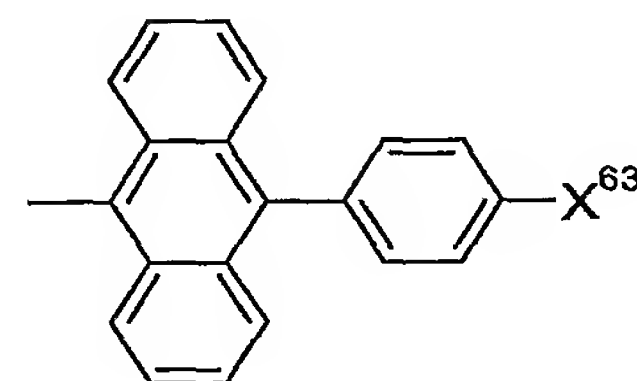
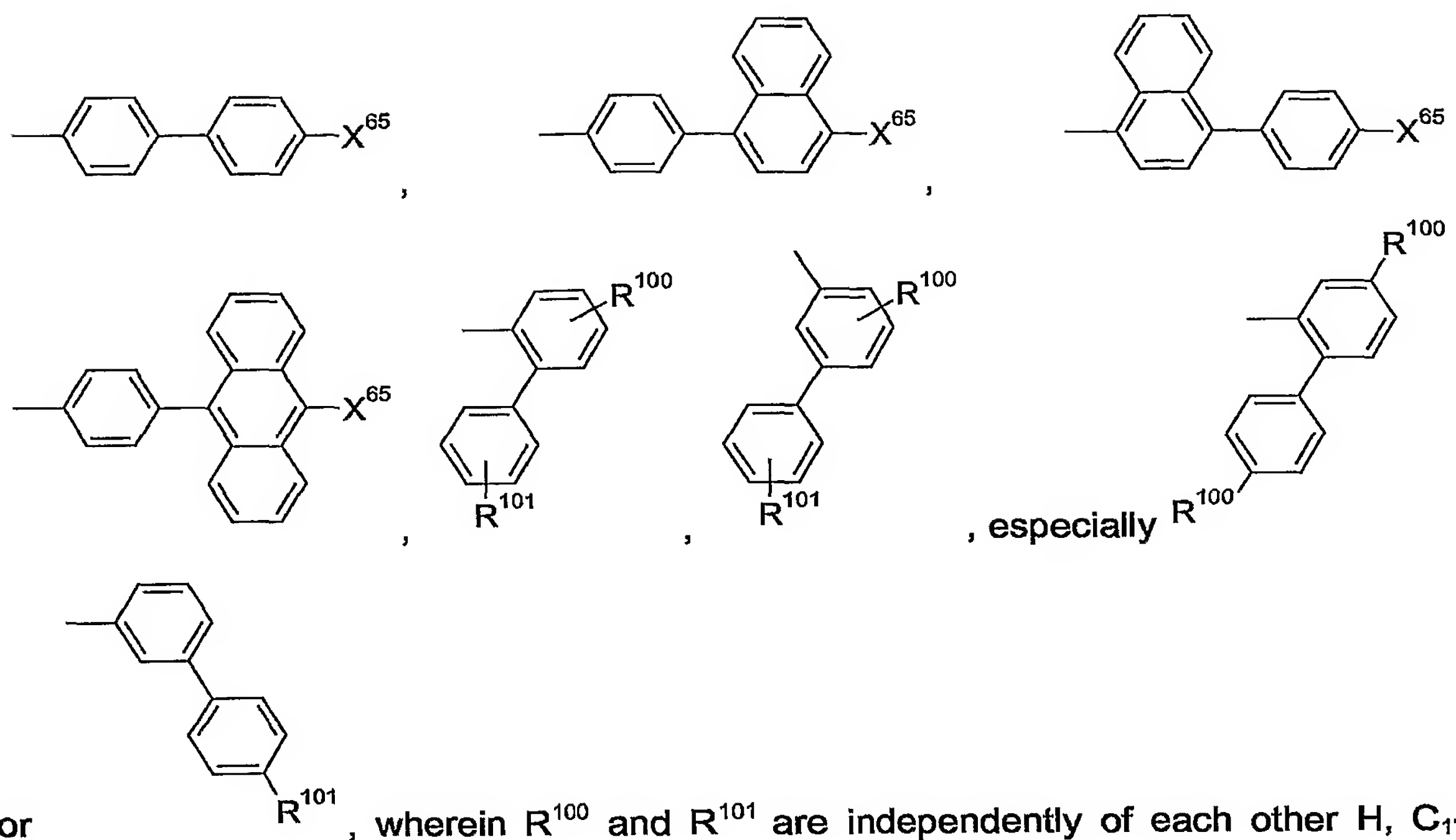
, wherein R^6 is C_1 - C_{24} alkoxy, or $-O$ - C_7 - C_{25} aralkyl, R^7 is H, or C_1 - C_{24} alkyl, R^9 and R^{10} are independently of each other C_1 - C_{24} alkyl, especially C_4 - C_{12} alkyl, which can be interrupted by one or two oxygen atoms, and $R^{25'}$ is C_1 - C_{24} alkyl, or C_6 - C_{10} aryl.

8. A 2H-benzotriazole compound according to claim 1, wherein the 2H-benzotriazole is a compound of formula

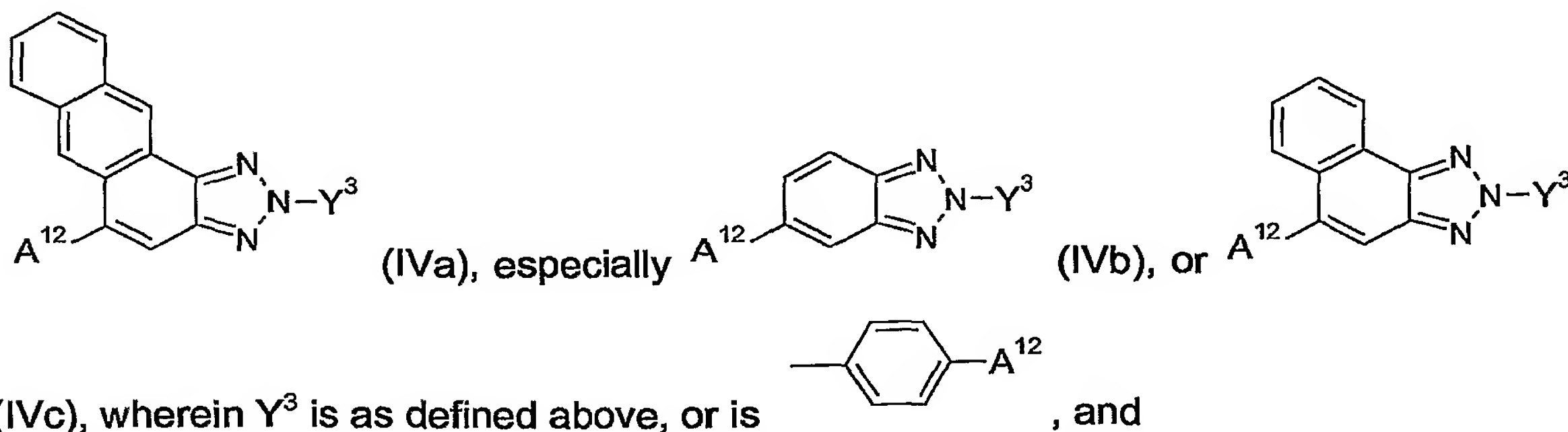
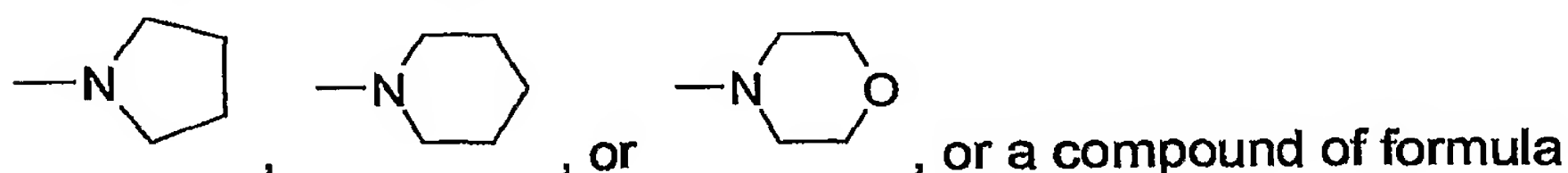


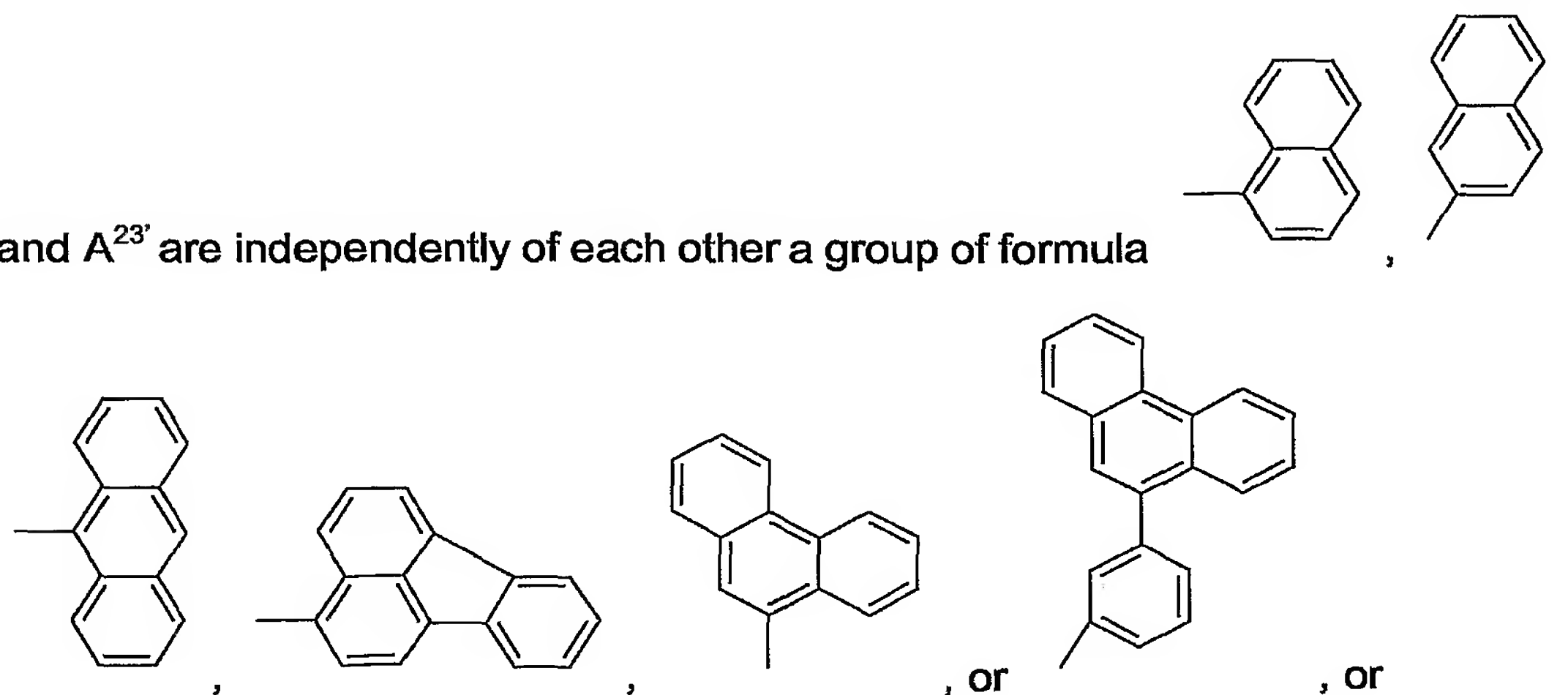
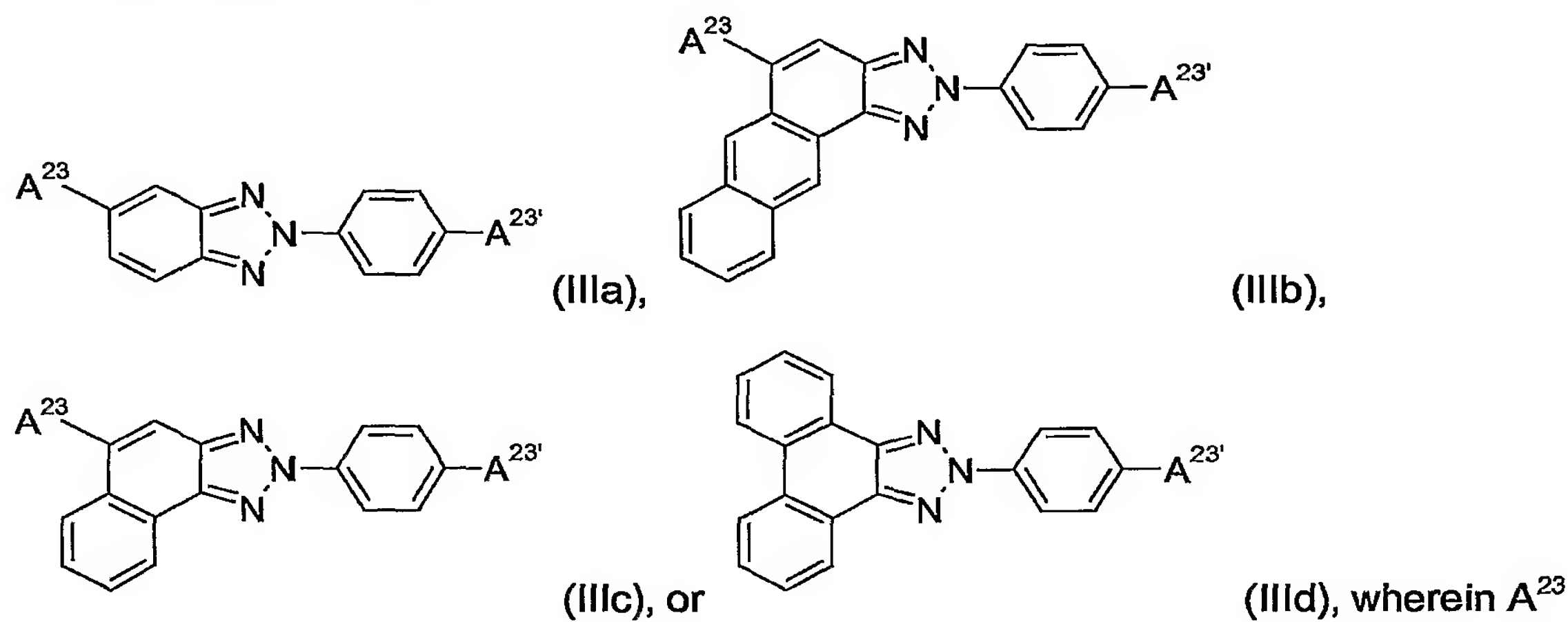
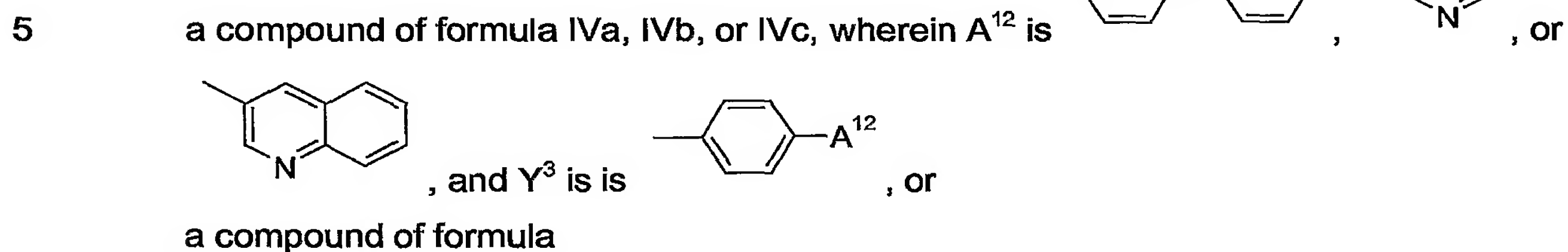
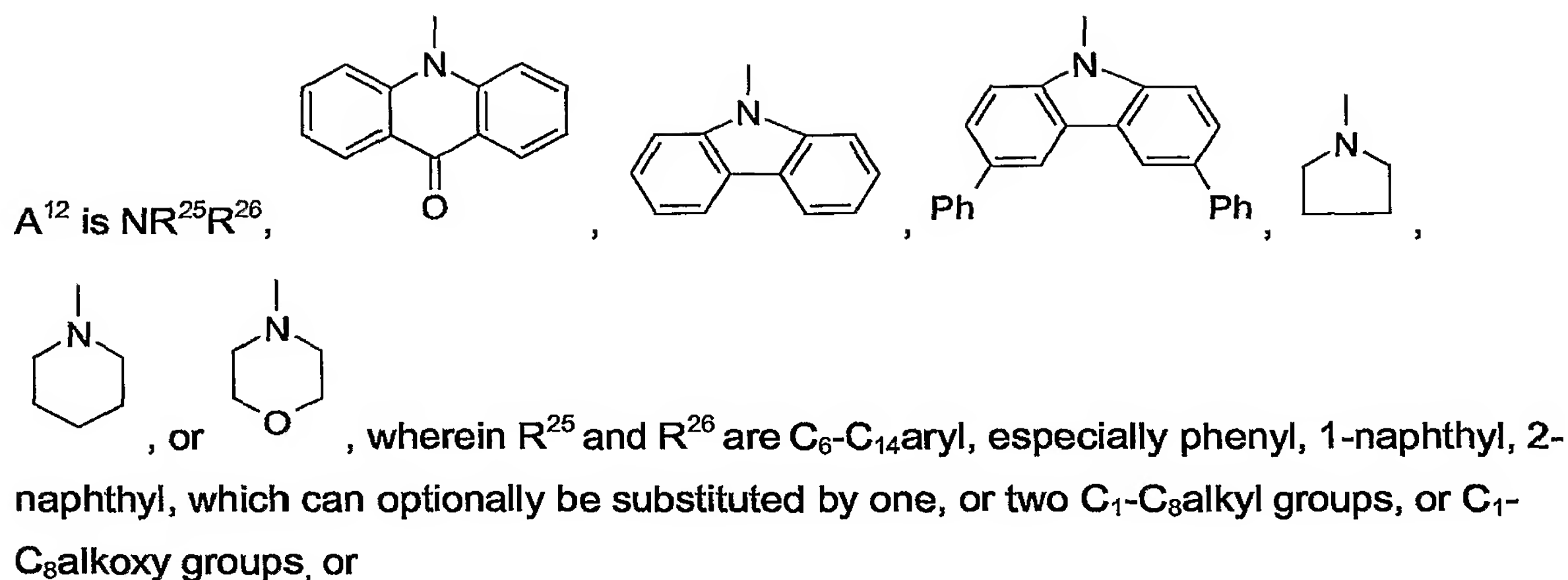
R^{102} is C_1 - C_{24} alkyl, especially C_1 - C_{12} alkyl, in particular H, A^{23} is a group of formula



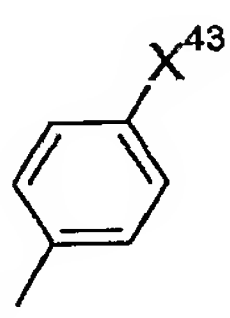
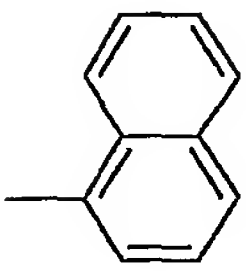
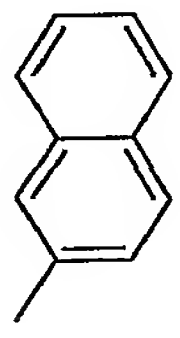
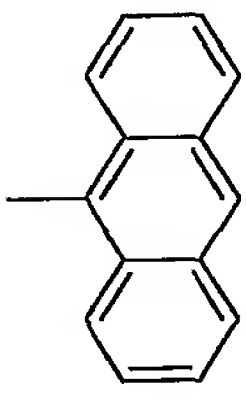
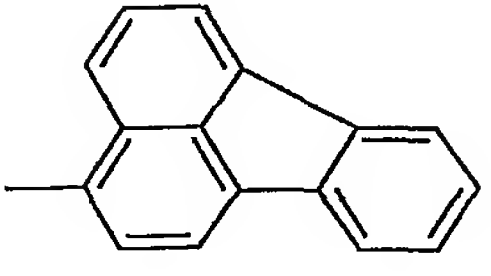


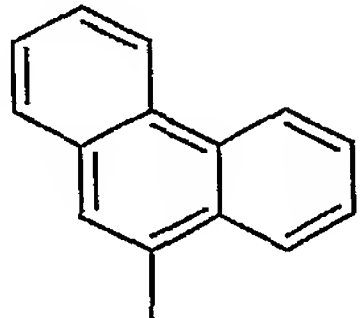
5 C_{24} alkyl, especially C_1 - C_{12} alkyl, very especially tert-butyl, or
 wherein X^{51} , X^{52} , X^{53} , X^{63} , X^{64} , X^{65} and X^{66} are independently of each other fluorine, C_1 - C_{24} alkyl, especially C_1 - C_{12} alkyl, very especially tert-butyl, C_5 - C_{12} cycloalkyl, especially cyclohexyl, which can optionally be substituted by one, or two C_1 - C_8 alkyl groups, or 1-adamantyl, C_1 - C_{24} perfluoroalkyl, especially C_1 - C_{12} perfluoroalkyl, such as CF_3 , C_6 - C_{14} perfluoroaryl, especially pentafluorophenyl, $NR^{25}R^{26}$, wherein R^{25} and R^{26} are C_6 - C_{14} aryl, especially phenyl, which can be substituted by one, or two C_1 - C_{24} alkyl groups,
 10 or R^{25} and R^{26} together form a five or six membered heterocyclic ring, especially

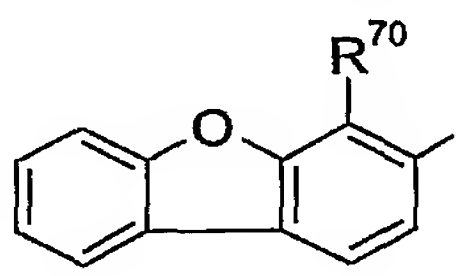




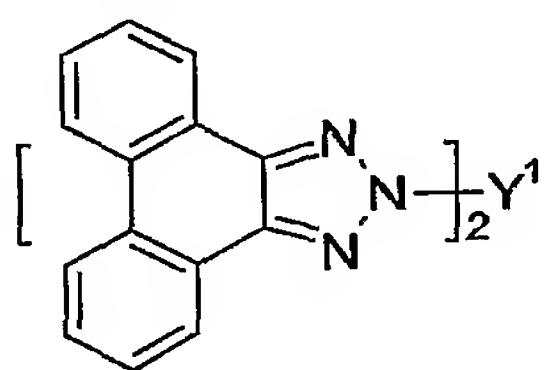
a compound of formula Ia, Ib, Ic, or Id, especially , wherein A¹² is H,

a group of formula , , , , or ,

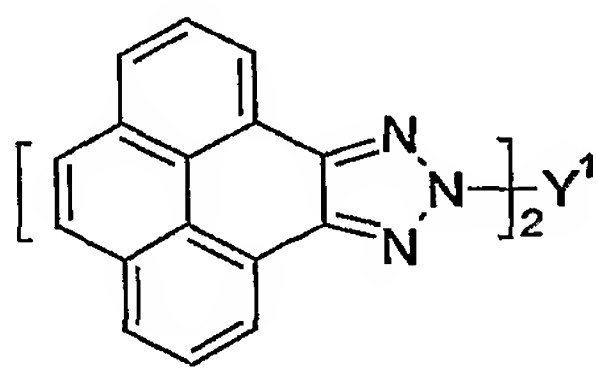
especially , wherein X⁴³ is C₁-C₂₄alkyl, especially C₁-C₁₂alkyl, Y³ is a

group of formula , wherein R⁷⁰ is C₁-C₂₄alkyl, especially C₁-C₂₄alkoxy.

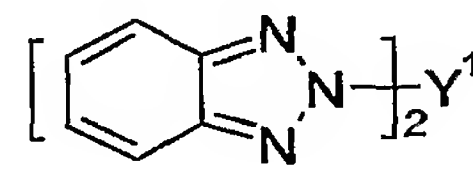
9. A 2H-benzotriazole compound according to claim 8, wherein the 2H-benzotriazole is a compound of formula



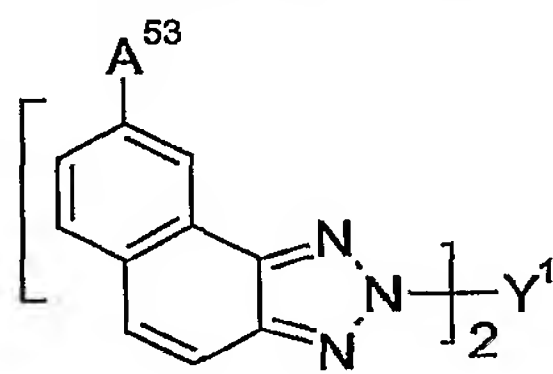
(IIc),



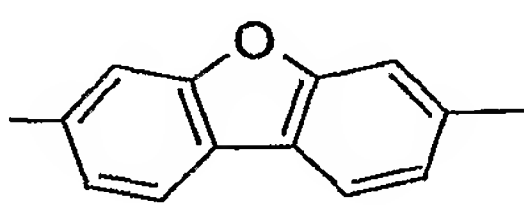
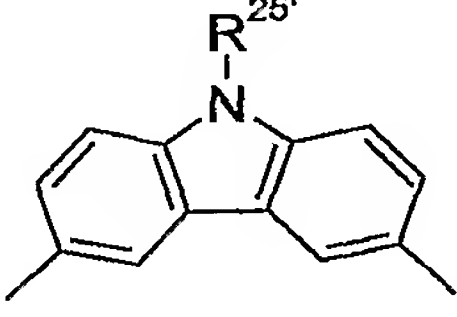
(IIId), especially

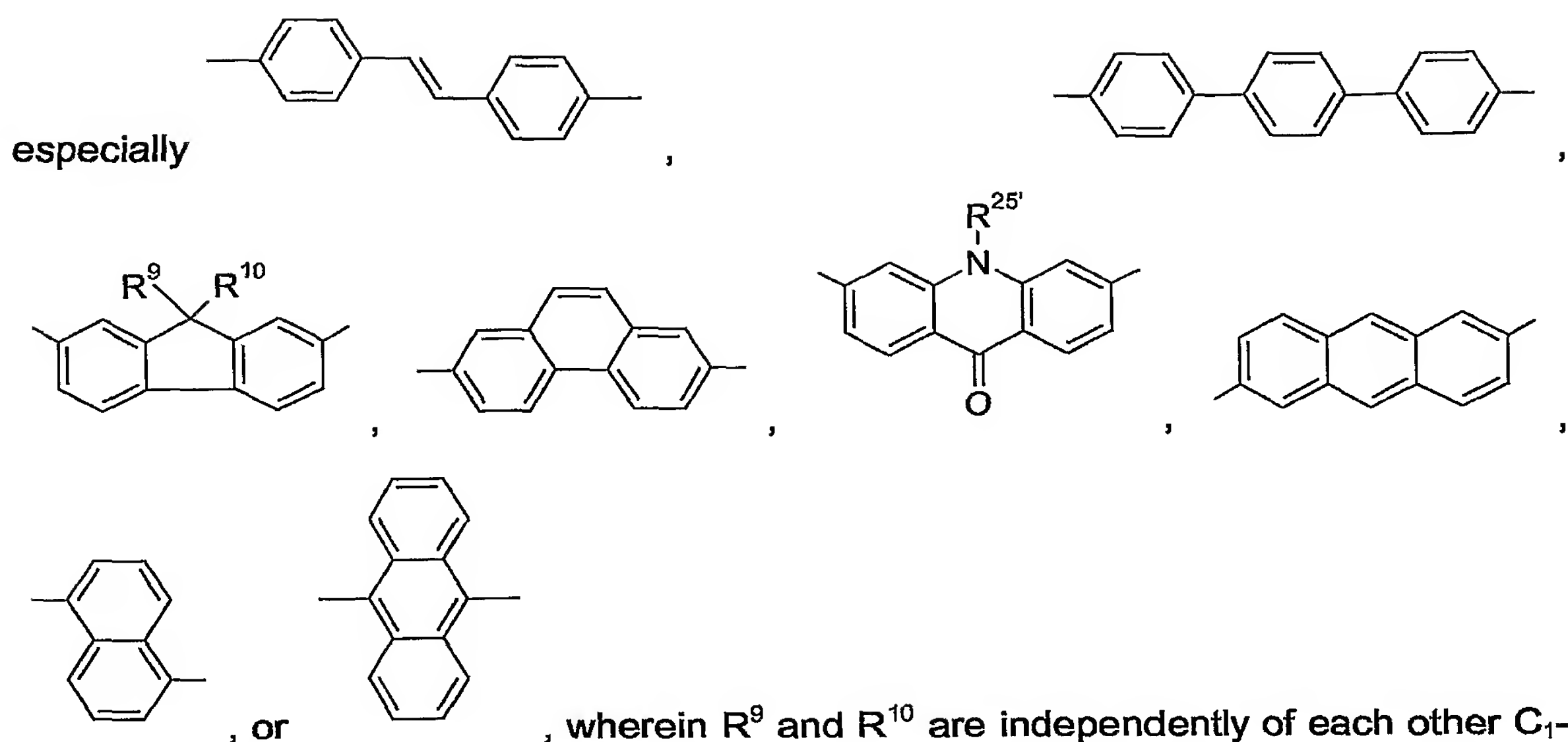


(IIa), very especially



(IIb), wherein A⁵³ is C₁-C₂₄alkyl, especially C₄-C₁₂alkyl, in

particular H, Y¹ is a group of formula , or ,



10. An electroluminescent device, comprising a 2H-benzotriazole compound according to any of claims 1 to 9.

10 11. The electroluminescent device according to claim 10, wherein the electroluminescent device comprises in this order

(a) an anode

(b) a hole injecting layer and/or a hole transporting layer

(c) a light-emitting layer

15 (d) optionally an electron transporting layer and

(e) a cathode.

12. The electroluminescent device according to claim 11, wherein the 2H-benzotriazole compound forms the light-emitting layer.

20

13. Use of the 2H-benzotriazole compounds according to any of claims 1 to 9 for electrophotographic photoreceptors, photoelectric converters, solar cells, image sensors, dye lasers and electroluminescent devices.